ANALYTICAL AND DIFFERENTIAL DIAGNOSIS OF NERVOUS DISEASES

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UNIVERSITY OF CALIFORNIA
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AN ATLAS

OF THE

DIFFERENTIAL DIAGNOSIS

OF THE

DISEASES OF THE NERVOUS SYSTEM

ANALYTICAL AND SEMEIOLOGICAL NEUROLOGICAL CHARTS

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To
Thomas Hun
a loving father
a learned physician
a man of wisdom and wit
this book is dedicated
in most grateful remembrance

Gregory - 7-28-42 - Psych.

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INTRODUCTION

AND

EXPLANATORY KEY OF THE CHARTS

The diagnosis of diseases of the nervous system is generally regarded by medical students as one of the most difficult subjects in their course of study. It is so difficult that many students become discouraged and after a few attempts make no strong, continued effort to master it and, perhaps in consequence, physicians generally are weaker in this than in other phases of their work. In the hope of making this task less difficult this book has been written. If the student can be taught to make the diagnosis of these diseases with comparative ease, it may happen that he will be led to undertake those further studies in the finer anatomy and physiology of the nervous system, which are essential for a full understanding of this difficult but fascinating department of medicine.

A careful physical examination and history of the case, as complete as can be obtained, are, of course, the essential basis of every diagnosis; but the commonly employed method of comparing the combination of symptoms thus obtained in any case with the various syndromes characteristic of the different diseases until a similar combination can be found, is not altogether satisfactory. More scientific and instructive is the analysis of each important symptom and the consequent ascertaining of the disease which must cause it under the circumstances (the other symptoms) existing in any individual case which may present itself.

In spite of its apparent complexity, the diagnosis of nervous diseases lends itself better than that of the diseases of most of the other organs to exact pathological analysis. Just as a chemist in analyzing a substance of unknown composition by a series of appropriate tests eliminates from consideration one group of chemical bodies after another until he finally discovers its class and name, so the neurologist subjects a patient to one test after another in definite sequence. As the result of each test he throws out of consideration one or more groups of diseases and assures himself that he has to do with a disease belonging to another definite group. With each successive test the number of diseases constituting a group becomes less, until finally one definite individual disease stands revealed among the few most closely related to it by a comparison of the remaining symptoms characteristic of each. This analytical method is used, I think, by all great teachers of neurology in demonstrating cases of disease before their classes of students. It is the crystallization of this teaching into the tabular form which this book attempts to present.

In using this book for diagnostic purposes the student, having made a complete investigation of the patient according to the scheme presented in chart I, should turn to chart X, or to some subsequent chart, according to the nature of the prominent symptom or symptoms present in the case. If motor paralysis (analysed in chart X) is present, the disease must be in the motor neurons and the student must decide from the history of the case whether it is a continuous or an intermittent paralysis, and if the former, he must learn from his physical examination whether the superficial and deep reflexes (of which the tendon reflexes are the best exponent) are present or absent within the paralysed area. This test will make it certain whether the disease involves the central or the peripheral motor neurons. If the reflexes are absent the disease involves the peripheral motor neurons and the examiner must learn from his physical examination whether muscular atrophy is present or not, or whether there is a mixture of atrophy and apparent hypertrophy and further whether the initial symptom was the paralysis or the atrophy. From this test the student can determine whether he has to do (1st) with a functional disease or (2nd) with one of the degenerative atrophies or (3rd) with one of the dystrophies. The diagnosis between the diseases constituting the degenerative atrophies can be made by the condition of the organic reflexes, showing whether or no the lumbar enlargement is involved and by the presence or absence of sensory disturbances, showing whether spinal nerve trunks, or cranial motor nerve trunks, or motor nuclei of nerves are involved. The ultimate diagnosis of the individual disease is to be made from the short abstract of the most important remaining symptoms characteristic of each disease.

If, on the other hand, the deep and superficial reflexes are present, or even exaggerated, the disease involves the central motor neurons. This large group is divided into smaller groups by noting (1st) whether the paralysis is a hemiplegia or a monoplegia (an intracranial lesion, or Brown-Séquard paralysis), a paraplegia (spinal cord lesion), or a local paralysis (a localized cortical lesion); (2nd) the manner of onset; (3rd) the time of life at which it occurred; (4th) the existence of sensory disturbances; (5th) the existence of symptoms of irritation (spasm, etc.), and (6th) whether spinal or cerebral symptoms are present. The ultimate diagnosis of the individual disease is to be made by the short abstracts as above. Finally, in the last section of chart X we have the intermittent paralyses, and a group of diseases in which both the central and the peripheral motor neurons are involved and which can be divided into smaller groups in the manner described above.

In the charts subsequent to the tenth, all the important diagnostic symptoms are analysed in a similar manner; so that it seems unnecessary to supply a key for each. At the left margin of each chart is placed the symptom to be analyzed; on the right margin are placed all the diseases in which this symptom can occur. By means of these charts it is possible to diagnosticate easily and rapidly any disease of the nervous system and to localize the lesion, when any lesion exists. If the examiner makes a mistake at any point, the next step in the process or the abstract of the other symptoms of the disease, will probably show him that he is in error and that it is necessary for him to retrace his steps.

For the sake of completeness certain trophic diseases are included, which, although causing a number of functional disturbances in the nervous system, are not really nervous diseases.

As might naturally be expected, the same disease, in so far as it presents many symptoms, appears a number of times in the different charts and even in the same chart; so that, in order to get a more complete idea of its symptomatology, it is essential that the different abstracts of it should all be read. To facilitate this, cross references by numbers within brackets are placed in the text.

Many diagnostic and technical terms are used which may not be familiar to the student; therefore these terms are classified, defined and their significance stated, as far as it is known to the author, in a series of charts preceding the diagnostic ones. Cross reference to these terms also is facilitated by the numbers within the brackets. A very full index, in the preparation of which the author has received much assistance from his friend, Dr. Dawes, also serves this same purpose.

The peculiar characteristic of this book on diagnosis is that it gives to the student or physician a key by which, in a comparatively easy manner from one or more important symptoms, he can arrive at a diagnosis. It also has the advantage that it divides the diseases into groups, the members of which have a definite relationship with each other; so that in the process of using the charts the student is constantly catching glimpses of the natural relationships between the different diseases of the nervous system. Although the symptoms of different diseases have often been contrasted in tables of parallel columns, in no other book, known to the author, has the subject been presented as it is here and this must be his excuse for publishing it and for any defects which it may show, as there was no model which could be followed in preparing it.

In the preparation of the charts the author has received valuable suggestions and aid from several friends and especially from Drs. Mosher, Gordinier and Archambault, while for the plates he is greatly indebted to Drs. Streeter and Hawn. To these, his present friends and former students and assistants, he gratefully acknowledges his indebtedness and returns his thanks.

PART I

THE EXAMINATION OF PATIENTS

AND A

PHYSIOLOGICAL AND PATHOLOGICAL ANALYSIS

OF THE

RESULTS OBTAINED FROM SUCH EXAMINATION

AN ANALYSIS OF THE

SUBJECTIVE AND OBJECTIVE SYMPTOMS OF DISEASE

Chart I—Case-Taking

METHODS OF EXAMINATION OF PATIENTS SUFFERING FROM NERVOUS DISEASES

Errors in diagnosis result more frequently from imperfect observation than from faulty reasoning.

	Data derived from	
Methods of Examining and Testing Patients	QUESTIONING	see chart I a.
	INSPECTION	see chart I b.
	PALPATION PERCUSSION	see chart I c.
	ELECTRICITY LUMBAR AND BRAIN PUNCTURE. OPHTHALMOSCOPY LARYNGOSCOPY THERMOMETRY	see chart I d.

Chart I a

Questioning

QUESTIONING

Methods of Testing

1 History of present illness. (Chart II)

Allow the patient to tell the story of the illness without interruption. Then ascertain the exact date and manner of onset (sudden or slow, prodromata, etc.) and the exact sequence of symptoms. Inquire into all details which may concern the case (headache, pain, paresthesiae, vertigo, insomnia, mental condition, emotions, memory, special senses, paralyses, spasms, fits, disturbances of organic reflexes, etc.), whether of recent or of old date. Seek for any possible cause (injury, poisons, drugs, infections, worry, shock, etc.). Be careful not to suggest answers to nervous people. Inquire into previous treatment and its effect.

2 Family and personal history. (Chart II)

Ascertain the occurrence, in the present, or past, generations of the family, of any nervous diseases, especially the neuroses (neuralgia, epilepsy, hysteria, insanity, suicide, drunkenness, etc.), or of syphilis, or tuberculosis. Inquire as to consanguineous marriages. Note patient's age, full address, race, his mental and physical development in school life, occupation, habits (alcohol, drugs, venery, masturbation, etc.), dwelling and previous illnesses, such as rickets, infectious diseases, chorea, fits, tuberculosis, syphilis (use discretion in this inquiry) and injuries at birth or later. Ascertain the condition of other organs (cancer and tuberculosis).

3 Consciousness. (Charts III & XVI)

Patient may lie in a stupor and make little or no response to questions, noises, shaking, pin pricks, or strong sensory irritations of any kind. He may appreciate neither his surroundings, nor his acts, nor the time and place, nor his own individuality. He can remember, after recovery, nothing of what happened while he was unconscious. There are all possible grades in impairment of consciousness from complete coma to a slight lack of attention and an inability to collect his thoughts. This can be learned by conversation with him.

4 Sanity. (Charts III & XVI)

Patient's conversation and manner may show that his brain acts in an abnormal way and that he entertains abnormal perceptions and ideas (hallucinations, delusions, compulsory acts and ideas, etc.). Ascertain if a change has taken place in the patient's normal mental state, and when. Note whether patient is elated, active, loquacious; or dull, inattentive, sluggish, distracted, evasive, suspicious, and why. Some cases may require prolonged observation. At times irritating questions may be desirable.

5 Intelligence. (Charts III, XIII & XVI)

In testing a patient's intelligence, we test his *general knowledge* by asking him to name the different days and the different months and by arithmetical, geographical, political and historical questions. His *power of observation* by showing him a number of things and asking him later to describe them. His *power of attention* by asking him to add a long column of figures or underscore a letter wherever it occurs in a page of print. His *power of comprehension* by asking him to explain something he has read or heard. His *association of ideas* by giving him a word and asking what other ideas it suggests to him. His *mental reaction time* by the time he takes to solve problems, or to name an object, the picture of which is shown to him. His *moral sense* by questions in ethics.

6 Memory and understanding. (Charts III, XIII & XVI)

An apparent defect in intelligence may be due to lack of attention, or may be shown by further questioning, by having him repeat long phrases, execute verbal and written commands and name objects shown to him, to be due wholly or in part to a loss of memory; either general (amnesia), or local (aphasia), especially to a failure to understand what is said to him (sensory aphasia); while reason and judgment are normal. Test memory for remote, as well as for recent, occurrences. Test his memory of statements made a few minutes previously, or of events of the day before, or of years before.

7 Emotions. (Charts III & XVI)

Patients may show by their conversation, if suitably guided, or by their manner, or by both, whether they are emotional or not. The emotional state of the patient and the mental characteristics discussed just above, can often best be learned from the statements of friends and relatives. Curious fears, the so-called "phobias," (235) are often present.

8 Speech. (Charts III, XIII & XVI)	Patient's speech may be altered and very defective, i.e., rational or irrational, limited vocabulary (aphasia), poor articulation (dysarthria), tremor in voice, monotonous, scanning speech, omissions of syllables and words. Speech is tested by conversation and by having patient name objects, repeat catch phrases, etc.
9 Reading. (Charts III, XIII & XVI)	Ask the patient to read aloud. Note any defect either in utterance or understanding.
10 Writing. (Charts III, XIII & XVI)	Ask the patient to write, spontaneously, from dictation and from copy. Note any defect in the character of the writing or in the ideas expressed.
11 Stereognosis. (Charts III, VI & XXII)	Ask the patient to name objects placed in his hand, his eyes being shut, after excluding anesthesia. Even without feeling them all over and by moving them about in his fingers, a normal person should be able to recognize many objects (metals, cloth, etc.) merely laid against the skin of his hand, face, foot, lips, etc. Stereognosis may, therefore, in exceptional conditions, be tested, although less perfectly, in other parts than the hands.
12 Sight. (Charts VI & XIV)	Ask the patient to read small print or Jaeger's test type at reading distance (10 to 16 inches, according to age, refractive conditions, etc.) and Snellen's test letters at twenty feet. If patient cannot read the appropriate line at twenty feet the loss of vision is expressed by the number of feet from the chart at which he can read this line divided by twenty. Thus at ten feet the vision would be expressed by $\frac{10}{20}$. In great defect of vision the patient may be able to see only dimly the hand moved before his eye, or may only be able to distinguish between light and darkness.
13 Color sense. (Chart VI)	Ask the patient to match different colored worsteds.
14 Field of vision for white and colors. (Hemianopia) (Charts VI & XIV)	Place the patient with back to the window or light and have him close his left eye and with his right gaze at the observer's left eye. Then let the observer move his hands about in a plane mid-way between himself and the patient; so that each should see the hand at the same instant as it comes into the field of vision. The observer can see if the patient's eye wanders from his own and recall it. Test left eye in same way. If any defect in field of vision is suspected, use a perimeter. With a perimeter not only the field of vision, but also, by using different colored papers, the color field can be mapped out. Normally the color field is largest for blue, then for yellow, orange, red, green, etc., in the order named. If this order is changed there is said to be an "inversion of the color fields" (849). Normally the lines limiting the different color fields are everywhere separate from each other. If they touch or cross there is "interlacing of the color fields" or "dyschromatopsia" (849).
15 Hearing and tinnitus aurium. (Charts VI & XIV)	The patient's hearing may be tested by voice, watch, or tuning fork. Be sure there is no wax in the ear. Galton's whistle should be used for testing high and low notes. Each ear should be tested separately. Bone conduction is tested by holding watch or tuning fork firmly on skull. Normally a tuning fork, which, held on mastoid ceases to be heard, can still be heard when held close to meatus (Rinne's test). Normally a vibrating tuning fork, held on center of forehead, is heard equally in both ears. If heard best in the deaf ear (positive) the lesion is in external or middle ear. If heard best in the normal ear (negative) the lesion is in inner ear or in auditory nerve (Weber's test). We also ask about ringing in ears (tinnitus aurium).
16 Smell. (Charts VI & XIV)	Ask patient to name from its odor any fragrant substance (such as asafoetida, cloves, peppermint, etc.) held for a moment beneath each nostril in turn, the other being closed. Ammonia and acetic acid should not be used in this test.
17 Taste. (Charts VI & XIV)	Ask the patient to point to the name on a printed card of the taste of a strongly bitter, sweet, salt or sour solution touched from a medicine dropper, or a camel's hair brush to one side after the other of the protruded tongue. The tongue should be well washed between each test.
18 Sleep.	The amount of sleep which the patient gets in the twenty-four hours is always an important question. Insomnia (agrypnia) is present in many nervous diseases and is apt to be exaggerated by patients; so that their statements should be controlled, when possible, by those of the nurses or relatives. Many symptoms, especially fears, are worse at night: " Pavor nocturnus of children."

Chart I b

Inspection (mainly)

INSPECTION

Methods of Testing

20 Facial expression and general appearance and behavior. (Charts XIII & XVI)	The expression of the patient's face indicates, in most cases, the degree of his intelligence and his emotional state (sad or gay or anxious), and also may suggest the presence of certain diseases and conditions; such as myxedema (1163), acromegaly (1183), scleroderma (1165), exophthalmic goitre (1193), paralysis agitans (677), nasal obstruction, atheroma of temporal arteries, notched teeth, hazy cornea, etc. His general appearance and behavior often indicate his power of self restraint (inhibitory power, breeding), or the existence of hallucinations (213) of sight, hearing, touch, or of compulsory acts (218).
21 Walk. (Chart XIII)	The walk of the patient may suggest the presence of hemiplegia (254), paraplegia (257), local paralysis (259), ataxia (motor or cerebellar) (248), spasm (242), atony (252), paralysis agitans (677) and other tremors (250), pseudohypertrophic paralysis (500), hysterical paralysis (527), foot drop, (bilateral in multiple neuritis and lead palsy, unilateral in acute anterior poliomyelitis), weakness, exhaustion, etc.
22 Skull. (Chart XVI)	The skull should be observed as to type (brachy- or dolicho-cephalic, round or long heads), size (microcephalic—small, macrocephalic—large), rickets (box shaped), general or local hydrocephalus (bulging), fontanelles and sutures, asymmetry, tumors, etc.
23 Vertebral column. (Chart X)	The spinal column should be observed as to curvature (angular or lateral), scoliosis, kyphosis, spina bifida (occulta), deformity (dislocation), Pott's disease, tumor, tenderness (by palpation), etc.
24 Eye. (Charts V, VI & XIV)	Note the existence of arcus senilis, the condition of pupils (unequal, anisocoria (341), myosis (340), mydriasis (339), and irregularity), the presence of keratitis or iritis, prominence of eyeballs, nystagmus, squint, ptosis, paralysis, etc.
25 Pupillary reflex to light. (Charts V & XIV)	Note whether each pupil, the other eye being covered, dilates and contracts as the eye is alternately shaded by the hand and exposed to light, or an electric light is flashed into it; vision being constantly fixed upon some distant object. When a pupil contracts to light (direct reflex) the pupil of the other eye also contracts (consensual reflex).
26 Hemiopic reflex. (Charts V & XIV)	Note whether the pupil contracts as light is flashed on each half of the retina alternately. A ray of light collected by a lens should be used in this test. This reflex is difficult to obtain, and not entirely reliable.
27 Pupillary reflex to accommodation. (Charts V & XIV)	Note whether the pupil dilates when the patient looks at a distant object and contracts when he looks at one so near his face as to require convergence of the eyes. This test can be made in a blind man by having patient first converge his eyes and then make the axes of his eyes parallel.
28 Double vision, diplopia. (Charts VI & XIV)	Note which eye deviates, however slightly, from the direct axis of vision and which eye lags more or less on movement of eyeballs in following the moving finger. Place a colored glass before the affected eye, move a bright object (candle) throughout the field of vision and have the patient note the relative position of the two images. The colored image will of course be the one seen by the affected eye.
29 Secondary deviation of the sound eye. (Chart XIV)	Hold a card close in front of the sound eye. Have the patient look at an object so held that the weakened muscle must be brought into action. The sound eye covered by the card will be observed to move too far and when the card is removed the sound eye will quickly move back into proper position.
30 Nystagmus. (Charts IV & XII)	The oscillation of the eyeball which constitutes nystagmus is often plainly to be seen. Extreme deviation of the eyeballs in one direction or the other makes it more evident, and at times demonstrates a nystagmus not otherwise apparent. If present, nystagmus is usually recognized while making the two tests 28 and 29. It should not be confounded with the irregular jerky motion of a weakened ocular muscle attempting to move the eyeball.

31 Tremor. (Charts IV & XII)	Note any tremor of lips, tongue, or other parts of the body. Note its frequency, amplitude, its relation to voluntary movements and whether it is associated with muscular rigidity. In testing for tremor, ask patient to hold arms extended before him or over his head with fingers spread and motionless.
32 Convulsion and spasm. (Charts IV, XI & XII)	Note any convulsion, spasm, contracture, athetosis, choreiform movement, etc., which may be present.
33 Paralysis (motor). (Charts IV, X & XIII)	Note any obvious paralysis, such as ptosis. Note the naso-labial fold and the height of the angle of the mouth on each side. While under close inspection, patient should be requested to execute every possible motion: i.e., wrinkle forehead (look upward, or open eyelids held closed by observer), frown, open and shut each eyelid, move eyeballs up and down and to either side (note whether upper eyelid follows eyeball well downwards), whistle, laugh, distend cheeks, raise upper lip and each angle of mouth, protrude tongue straight and move it in all directions, raise uvula in phonation, close jaws and move chin forwards and jaw laterally, contract strongly all muscles of face at once, move head backwards, forwards and towards each shoulder and shake it, bend body in all directions, raise arms vertically, raise shoulder, adduct and abduct arm, flex and extend elbow, wrist and each finger, spread fingers, adduct, abduct, flex and extend thumb, pronate and supinate forearm while elbow is flexed, stand on each leg, raise body on tiptoes, adduct and abduct thigh, flex and extend thigh, leg, foot and toes.
34 Paresis. (Charts IV, X & XIII)	Make strong resistance to above mentioned movements while patient is executing them: i.e., pull on eyelids, on one angle of mouth, resist movements of jaw, or of bending head or body, or of flexing, extending, adducting and abducting joints, compare the strength of the paretic muscle with that of a similar healthy one, when possible with its fellow of the opposite of the body. For future comparison, etc., the strength of the paretic muscle can be registered by dynamometers, of which the most practical is the one for the hand grasp. Or sufficient weights may be placed on hand, foot or head to overcome the attempted movement.
35 Myasthenia. (Chart IV)	Note whether patient tires easily on repeated or continuous activity of any set of muscles.
36 Diadocokinesia. (Chart IV)	Note whether patient can alternately extend and flex joints quickly and repeatedly. Test especially rapid alternate supination and pronation.
37 Ankylosis.	Note whether any joint is rigid, so that it cannot be moved. Ascertain the cause of the rigidity, whether bony union, contracted muscle or contracted scar tissue (muscle, ligament, skin, etc.).
38 Contracture. (Charts IV & XI)	Note whether any muscle is contractured with consequent impaired motility of the joint and whether this contracture can be overcome by force, with or without etherization (active contracture), or not (passive contracture).
39 Muscle tone. (Charts IV & X)	Note whether muscles are firm or flabby, and whether or not resistance is offered to rapid passive motions of joints while the patient tries to make no voluntary resistance. Normally there is slight resistance. In disease the resistance may be altogether absent (atonia), or weak (hypotonia), or strong (hypertonia).
40 Trophic lesions. (Chart XVII)	Note whether any muscle shows atrophy or hypertrophy, or fibrillary contractions, or if there is any arrested development or trophic lesions of other tissues (especially ulcers, herpes, glossy skin, abnormalities of nails, etc.).
41 Co-ordination (asynergy). (Charts IV & XII)	Note whether complicated movements are executed in an orderly manner while the patient's eyes are closed. Ask patient to walk, touch point of nose with finger tip, pick up objects, write, touch knee with heel of other foot, hold foot steady in one position, trace a circle in the air with foot, walk backwards, walk along a line, stand on one foot alone, or on both feet close together, either side by side or one in front of the other (Romberg's symptom), stand on tiptoes or on heels, stand on one foot and trace a circle on the floor with the toe of the other foot. All these tests should be made both with eyes open and shut.
42 Muscle and joint sense. Deep sensibility (bathyesthesia) (akinesthesia). (Charts VI & XII)	Note whether patient, with his eyes shut, can tell whether his joints are flexed or extended, or can duplicate with one extremity the position in which his other is placed. Note whether he can estimate weights correctly or can grade by weight loaded balls correctly. Note whether he can locate his extremities in space. To test this, his eyes being shut, an extremity after being moved about is held in one position and he is told to turn his head and eyeballs so that when he opens his eyes he shall be looking directly at his thumb or great toe. When he opens his eyes it will be plain to see whether they are directed right or not.

Chart I c

Palpation and Percussion

	Methods of Testing
45 Circulation and respiration. (Chart XVII)	Note the color of the skin, the pulsation of arteries in neck, the condition of the jugular veins and the frequency and regularity of respiration, especially Cheyne-Stokes' respiration (435), whether respiration be costal or abdominal, or diaphragm be immobile, unilaterally or bilaterally.
46 Pulse. (Chart XVII)	Note pulse of patient as to frequency, volume, tension (best tested by tonometer or sphygmomanometer) and irregularity in rhythm and force.
47 Difficulties in sensory testing. (Chart VI)	The result of all sensory tests (and the same is true in regard to tests for many mental symptoms) depends upon the patient's truthfulness. Deception is always possible and even with the most truthful patients the tests require much time and the results are often contradictory, especially so in excitable and in uneducated patients, who cannot fix their attention continuously. Nothing should be present to distract the patient's attention and his skin should be warm. In some nervous diseases the patient has occasional, spontaneous sensations which interfere with the tests. Most patients under the education of repeated tests become more acutely sensitive. On the other hand, tests too long continued tire the patient and give rise to contradictory results. It is to be remembered that the sensibility of the skin both for tactile and painful impressions varies greatly in different parts of the body and in different individuals.
48 Tactile sensibility. (Charts VI & XIV)	With the finger tip (or with a smaller and lighter object, such as the head of a pin, a camel's hair brush, a pledget of cotton, a hair, etc.), touch the patient's skin lightly, having told him to say "yes" every time he feels the slightest touch. Or the patient may describe figures (space sense) traced on his skin with ink (to prevent dispute or doubt). Of course, during all sensory tests the patient's eyes must be closed or covered. In some cases of hysterical anesthesia, if the patient is told to say "no" when she does not feel the touch, she will say "no" only at the instant she is actually touched within the anesthetic(?) area; showing that sensation is not abolished, although it may well be abnormal. Tactile sensibility may also be tested with the aesthesiometer; a pair of blunt dividers, by which it is noted how far the points may be separated and yet be felt as one. This distance varies greatly in different parts of the body (at the point of tongue it is one m.m., at finger tips two m.m., along back and on upper part of arm and thigh it is sixty-five m.m. The distance is smaller transversely than longitudinally on the extremities. Neither this compass aesthesiometer, nor Herring's aesthesiometer gives more valuable results than the pinhead tests. When mapping out an anesthetic area commence in the anesthetic area and work towards the normal skin. Do the reverse in mapping out hyperesthesia; i.e., from normal skin to hyperesthetic area. The electro-cutaneous test can be more accurately measured, but is of little practical value.
49 Pressure sense. (Chart VI)	Note whether patient can estimate correctly the amount of pressure exercised by the finger pressed against the skin, or by weights laid upon it.
50 Painful sensibility. (Charts VI & XIV)	Note whether patient feels pain when pinched, or when skin is pricked by fingernail, pin-point, or other sharp substance.
51 Retardation of conduction. (Chart VI)	Note whether the painful sensation is felt immediately upon, or some seconds after, the painful contact.
52 Persistence of sensation. (Chart VI)	Note whether the painful sensation persists a longer time, after the painful contact has ceased, than is normal.
53 Localization. (Chart VI)	Note whether the point of contact, tactile or painful, can be localized correctly by the patient either by description or by pointing; his eyes, of course, being shut.
54 Double sensation and polyesthesia. (Chart VI)	Note whether a single tactile or painful contact causes two (double sensation), or more, sensations (polyesthesia).

55 Temperature sense. (Chart VI)	Touch the skin at numerous points alternately with small test tubes, one filled with hot, the other with cold, water, or with hot and cold bodies (spoons) of the same size and form. Certain points of the skin are especially sensitive to heat; others to cold. It is well, therefore, to test for heat and cold separately.
56 Pallesthesia. (Chart VI)	Note whether the patient feels the vibration of a tuning fork (vibration sense) pressed so firmly on the skin that the vibration can be transmitted through the underlying bone (osseous sense).
57 Cutaneous reflexes. (Chart V)	Stroke or scratch, as softly as will suffice, with finger nail or head or point of pin, the skin of the sole of the foot (plantar and Babinski), or a buttock (gluteal), or the inner side of thigh (cremasteric), or the side of abdomen (umbilical), or the hypochondrium (epigastric), or interscapular region (interscapular), or stroke firmly along the postero-internal border of the tibia (Oppenheim's reflex) and note the resulting movement. The muscle itself must be felt and watched in cases where the resulting contraction is too slight to move the part.
58 Mucous membrane reflexes. (Chart V)	Touch with finger, straw, brush, or probe, the cornea or conjunctiva (conjunctival), or mucous membrane of nose (nasal), or palate (uvular), or pharnyx (pharnygeal), and note the resulting movement.
59 Vaso-motor reflexes. (Charts V&XVII)	Note the pallor or redness of the skin, also rapid changes and flushings with or without irritation, such as scratching with a pin or fingernail (dermographia).
60 Ankle-clonus. (Charts V & X)	With leg relaxed, semi-flexed and well supported, strike or press the sole of the foot quickly, firmly and continuously upwards and note whether the foot oscillates or not.
61 Knee-jerk. (Charts V & X)	While patient is sitting on a chair with legs crossed, or better on a table with legs hanging free, or is lying in bed on his back with knees flexed, strike the ligamentum patellae a sharp blow with the finger, edge of hand, book or percussion hammer and note whether the foot flies forward. The amplitude of the excursion of the foot is not alone a safe guide to infer increase of knee-jerk, but rather its vigor, its quickness, and the presence of two or three additional oscillations as the foot falls back again. Even a continuous oscillation, or clonus, occurs in some cases (the so-called "spinal epilepsy"). More common than this clonus is a simultaneous contraction of the adductors of the other thigh when the knee-jerk is exaggerated. In order to obtain this reflex the observer must make sure that the muscles of the legs are completely relaxed. The extensor femoris muscle must be observed and felt in those cases where the resulting contraction is too faint to move the leg. Knee-clonus may be obtained in suitable cases by grasping the patella from above and pulling it sharply downwards.
62 Achilles reflex. (Charts V & X)	While patient is kneeling in a chair with his feet projecting free, the tendo-Achillis should be strongly struck with a percussion hammer and the movement of plantar flexion noted. Where the patient cannot kneel the leg may be supported in any position which relaxes it and the tendo-Achillis struck.
63 Dorsal foot reflex. (Chart V)	When the dorsum of the foot is struck sharply over the 4th or 5th metatarsal bones either no reflex or a dorsal flexion of the toes occurs normally, but in cases of pyramidal tract lesions a plantar flexion of toes occurs (Mendel-Bechterew's reflex).
64 Elbow and wrist reflexes. (Chart V)	The arm being relaxed, well supported and semi-flexed at elbow the tendons at elbow or wrist are sharply struck.
65 The jaw reflex. (Chart V)	The patient's chin is firmly grasped with finger and thumb or a flat stick is placed in the patient's mouth resting on his lower teeth, the mouth being half open, and then the stick or the hand holding chin is struck sharply downward and the closure of the mouth noted.
66 Kernig's reflex. (Charts V & X)	With thigh flexed at hip and leg flexed at knee, the patient either sitting or lying, the leg should be quickly extended at knee joint and a strong resistance to such extension noted, if present.
67 Mechanical irritability.	Strike the nerve or muscle sharply with the finger or percussion hammer or press the nerve trunk or its tender points.
68 Reinforcement.	The tendon, and to some extent the cutaneous reflexes, can be made stronger and can be often made to appear when apparently absent, by diverting the patient's attention in any way, usually by having him pull strongly on his clasped hands, his eyes being turned to the ceiling or to a picture at the instant the reflex is tested (Jendrassik).

Chart Id

Electricity, Lumbar Puncture, Brain Puncture, Ophthalmoscopy, Thermometry, Caloric Reaction

ELECTRICITY AND LUMBAR PUNCTURE

Methods of Testing

70 Faradism. (Chart VII) The electrodes should be kept well moistened with warm salt water during the testing. The larger electrode is placed on sternum or back of neck or sacrum; while the smaller electrode, provided with an attachment for making and breaking (opening and closing) the current, is placed over the motor point of nerve or muscle. The secondary current of a faradic battery should be employed and the current should be gradually increased in strength by methods which vary in different batteries, until the faintest distinct contraction of the muscle occurs whenever the current is suddenly closed, the negative electrode being over the motor point. The test should be repeated several times. As the skin becomes moister a less strong current becomes necessary. It is important to make sure of the exact position of the motor point in each case by some preliminary tests and not to let the electrode slip away from this point during the testing.

71 Galvanism. (Chart VII) With the electrodes arranged as above, first the negative, later the positive, electrode should be placed over the motor point of nerve or muscle and the strength of the current slowly increased by means of the rheostat until the faintest distinct contraction of the muscle occurs whenever the current is closed. The strength of the current causing this contraction, with each electrode in turn over the motor point, should quickly be read from the galvanometer, even before the needle has quite ceased its oscillations. In the same way read from the galvanometer the strength of the weakest current which will cause the faintest distinct contraction, when each electrode in turn is on the motor point and the current suddenly opened.

72 Muscle and nerve. (Chart VII) In all cases both the muscle and the nerve supplying it should be tested both by faradism and galvanism.

73 Character of the contraction. (Chart VII) Note the character of the muscular contraction, whether quick or sluggish (degenerative), or showing any peculiarity, and whether it is unusually persistent (myotonic), or whether it rapidly grows feebler under repeated tests (myasthenic).

74 Lumbar puncture. (Charts VIII & XIX) The patient's body should be bent strongly forwards. Patient should, if possible, sit, but may be lying down. The skin having been thoroughly washed with alcohol, a horizontal line should be drawn from the posterior spine of one ilium to the other and a sterilized fine needle three or four inches long, preferably of platinum and with rather a short bevel, should be inserted between the laminae of the vertebrae immediately below or above this horizontal line. The needle may be inserted in the median line or a little to one side of it and pushed steadily forward and slightly upward until it enters the arachnoid sac when usually the cerebro-spinal fluid will escape in drops. If the needle be pushed too far it can be felt as it strikes the body of the vertebra and it should then be withdrawn about half an inch. It is rarely necessary and sometimes dangerous to attach a syringe and aspirate the fluid. If the needle becomes occluded clear it out with the stylet. It is better not to withdraw more than half an ounce of the fluid. Note the rapidity of escape, whether by drops or in a fine stream (tension), its appearance (cloudy, bloody, purulent). The fluid may be examined chemically (for albumen, sugar, cholin, etc.). A portion of the fluid, especially that containing the fine coagulum which frequently forms, is centrifuged, the clear fluid is carefully poured off and the bottom of the tube scraped and aspirated with a capillary pipette, the content of which is spread on a slide, fixed, stained and examined for cells (lymphocytes, leucocytes, bacteria, etc.), The cerebro-spinal fluid should also be tested for an increase of globulin indicative of the presence of a syphilitic infection, of ancient or recent date, or of a meningitis, according to the method suggested by Noguchi (419). After lumbar puncture patients should remain quiet in bed during twenty-four hours. Even so, they are apt to suffer from headache, especially if much fluid has been withdrawn, or withdrawn too rapidly. Sometimes the nerve trunks of the cauda equina are injured, causing pain in the legs, but such pains are rarely severe and are of short duration. In some cases, in consequence of the withdrawal of the cerebro-spinal fluid, the medulla and cerebellum have been drawn down into the foramen magnum and death has resulted promptly. Such an accident is only possible in cases of cerebral tumor situated in the posterior fossa of the skull, and therefore lumbar puncture should not be performed in such cases.

BRAIN PUNCTURE, OPHTHALMOSCOPY, LARYNGOSCOPY, THERMOMETRY, AND THE CALORIC REACTION

75 Brain puncture. This operation consists in trephining (with avoidance of the sinuses and large arteries) a small button from the scalp and bone, inserting a very thin needle canula and aspirating a small quantity of the brain substance, or tissue of a tumor, or fluid from a cyst. It has been many times performed and the results have been somewhat encouraging, but it is an operation which should be performed only by an experienced surgeon or neurologist and its detailed description is hardly in place here.

76 Ophthalmoscopy. (Chart XIV) Examine the eyes for choked disc or optic neuritis, and for optic atrophy, retinitis, miliary tubercles, etc.

77 Laryngoscopy. (Chart XIII) Examine the larynx for evidence of paralysis of one or more or of all its muscles.

78 Thermometry. It is often necessary to ascertain the temperature of the patient. The thermometer should be well washed in cool water both before and after taking the temperature. In taking the temperature in the mouth, the bulb of the thermometer should be placed well under the tongue and it should be noticed that the lips are held tightly closed during the two minutes that the thermometer is left in the mouth. In taking the temperature in the axilla, the axilla should first be wiped dry from sweat and care should be taken that the thermometer be surrounded by skin and not at all by clothes; the patient should be rolled over on his side in order to press arm firmly against chest and the thermometer should be left in position eight minutes. In taking the temperature in the rectum, a little vaseline or soap-suds should be put on the bulb before inserting it into the rectum, where it should remain two minutes. Instruments have been invented for taking the surface temperature of the skin of any part of the body, but they have not proved to be of much practical value.

79 Caloric reaction. (Chart XII) When one ear of a normal person, with head held upright, is syringed out with cool water there results a horizontal and rotatory nystagmus towards the other ear; when water warmer than the body is used, the nystagmus turns towards the syringed ear. This reaction does not occur in cases of destruction of labyrinth, or of paralysis of the vestibular nerve.

Chart II

Analysis of the Subjective Symptoms of the Case

ANALYSIS OF THE SUBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

List of diseases most likely to occur as the result of the etiological factors obtained from the history of the case.

81 Heredity, including consanguineous marriages in neuropathic families (Predisposing cause)	84 Inherited Diseases	Organic Diseases	101 Idiocy and Imbecility 102 Spina Bifida and Meningocele 103 Hereditary (Huntingdon's) Chorea 104 Hereditary (Friedreich's) Ataxia 105 Myatonia Congenita 106 Myotonia Congenita (Thomsen's Disease) 107 Muscular Dystrophies 108 Syphilis of the Nervous System
	85 Inherited Tendencies	Neuroses	109 Insanity 110 Epilepsy 111 Hysteria 112 Chorea 113 Neurasthenia 114 Neuralgia 115 Drunkenness (alcoholism)
82 Personal Factors (Predisposing causes)	86 Age	Infancy and Childhood	106 Cerebral Palsy of Childhood 117 Acute Anterior Poliomyelitis 118 Meningitis (tuberculous, etc.) 119 Hydrocephalus 120 Tetany And all the inherited diseases except 103 and 106
		Childhood and Youth	121 Caries of Spine and Compression Myelitis 122 Meningitis (tuberculous, etc.) 123 Hereditary Ataxia 124 Glioma 125 Chorea 126 Epilepsy 127 Muscular Dystrophies 128 Hysteria 129 Insanity
		Adult	All other forms of Nervous Diseases and many of those above given
	87 Sex	More common in women	130 Hysteria 131 Exophthalmic Goitre 132 Neuroses
		More common in men	133 Locomotor Ataxia (Tabes) 134 Paresis 135 Injuries 136 Organic Diseases
	88 Race	Jewish & Latin	137 Neuroses
		Anglo-Saxon	138 Organic Diseases
	89 Dwelling Place, Habitation	Tropical	139 Beri-Beri 140 Leprous Neuritis 141 Sleeping Sickness
		Dampness	142 Neuritis
	90 Occupations	Overstrain	143 Occupation Neuroses
		Poisons	144 Neuritis

- 83 Etiological Factors (Inciting causes)
  - 91 Traumatism
    - Physical
      - 145 Wounds
      - 146 Hemorrhage in Brain, Cord or Membranes
      - 147 Meningitis
      - 148 Myelitis
      - 149 Disseminated Sclerosis
      - 150 Neuritis
      - 151 Tumors
      - 152 Abscess
    - Psychical, Acute & Chronic
      - 153 Hysteria
      - 154 Insanity
      - 155 Neurasthenia
      - 156 Traumatic Neuroses
  - 92 Poisons Toxic
    - Metallic
      - 157 Arsenical Neuritis
      - 158 Lead Palsy, Colic, etc.
      - 159 Mercurial Tremor
    - Alcoholic
      - 160 Multiple Neuritis
      - 161 Neurasthenia
    - Tobacco, Tea or Coffee
      - 162 Tremor
      - 163 Neurasthenia
    - Narcotic
      - 164 Drug Poisoning; Acute or Chronic
  - 93 Infections
    - Germs and Toxines
      - 165 Neuritis
      - 166 Meningitis
      - 166 Myelitis
      - 167 Acute Anterior Poliomyelitis
      - 168 Landry's Paralysis
      - 169 Neuralgia
      - 170 Tetanus
      - 171 Hydrophobia
  - 94 Syphilis
    - Tertiary Syphilis
      - 172 Gumma
      - 173 Meningitis Gummosa
      - 174 Neuritis Syphilitica
      - 175 Endarteritis Syphilitica
    - Post-Syphilitic Infections
      - 176 Locomotor Ataxia
      - 177 General Paresis
  - 95 Exhaustion
    - From Illness, Overstrain, Worry
      - 178 Neurasthenia
      - 179 Hysteria
    - From Venery and Masturbation
      - 180 Neurasthenia
  - 96 Extension of Inflammation
    - Caries of Skull or Vertebrae
      - 181 Cerebral or Spinal Abscess
      - 182 Sinus Thrombosis
      - 183 Meningitis
      - 184 Myelitis
      - 185 Neuritis
  - 97 Arterial Disease
    - 186 Apoplexy
  - 98 Metastasis from Other Organs
    - 187 Tumors
    - 188 Tuberculous and Suppurative Meningitis
  - 99 Disease of Other Organs
    - Bright's Disease
      - 189 Uremia
    - Diabetes Mellitus
      - 190 Diabetic Coma
  - 100 Cold is a doubtful direct, but probably an auxiliary etiological factor

Chart III—Disturbances of Mental Activity

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

Definition, Significance and Relationship of the Symptoms of Disease.

200
Disturbances of Mental Activity.

201
CONSCIOUSNESS

The appreciation of one's existence and individuality as separate from the rest of the universe (Subject consciousness). The content of consciousness is the sum of the present perceptions of the various sensations (Object consciousness), together with the memories of past perceptions and judgments (Experience) (Chart XVI).

202
INTELLIGENCE

The power of ascertaining facts and reasoning upon them. The power of discovering the relation of things and of acquiring knowledge (Chart XVI).

In disease, consciousness and intelligence may be either diminished or perverted as is set forth in Chart III a.

Neither intelligence nor consciousness is exaggerated or increased in disease, although the latter may be apparently so (Self-consciousness). In such cases, however, there is a concentration or limitation of consciousness rather than an increase of it; an exaltation of the subject with a lowering of the object consciousness.

203
MEMORY

The power of retaining in the mind and of recalling at will perceptions and ideas formerly received. The more striking the perception and the more frequently it is repeated or recalled, the better becomes its memory (Chart XIII).

204
EMOTIONS

An emotion is a state of consciousness accompanied by a feeling of pain, pleasure, fear, anger, wonder, scorn, etc. In health a person's emotion is usually in harmony with his environment, but in disease it may be quite independent of the environment (Chart XVI).

In disease, memory may be diminished in whole or in part, and the emotions may be either diminished or exaggerated as is set forth in Chart III b.

Memory is never increased in disease, although certain memories may be accentuated and others lost.

Chart III a

Disorders of Consciousness and Intelligence

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

CONSCIOUSNESS

		Diagnostic Symptoms	Definition	Significance
201 CONSCIOUSNESS	DIMINISHED	205 Coma	The patient lies in a profound stupor from which he cannot be aroused by irritation of any sensory organ (eye, ear, skin, mucous membrane, etc.). No voluntary acts are performed and the reflexes are abolished or diminished, except the circulatory and respiratory, which are often, but not always, deranged. Patient is unable to swallow. Lips and cheeks puff out during expiration.	These three conditions are not always sharply differentiated, but may merge into each other. They are due to loss or diminution of brain function in consequence of pressure upon the brain or of circulatory disturbances in it, or of poisons, etc. Occur in traumatism, and in many organic diseases of the brain and its membranes and especially of its blood vessels; also when toxic substances (morphia, etc.) or toxins (fever, etc.) are in the blood; also in Bright's disease and diabetes mellitus. Rarely the condition is functional.
		206 Semi-coma or Stupor	The patient is apparently in a coma but by strong sensory irritation can be aroused to some manifestation of consciousness. No voluntary acts are performed, but the reflexes are usually present. Patient can swallow. Patient may lie apparently awake, but really unconscious, with a low muttering delirium (Coma vigil).	
		207 Dazed, Bewildered, Somnolence or Stupor	The patient lies in a deep sleep or moves about automatically. Can be rather easily aroused, but does not fully appreciate his surroundings. Can speak more or less intelligently.	
	PERVERTED	208 Erroneous personality	A mental condition in which a person imagines himself to be different from what he really is; sometimes an animal, sometimes a famous character in history, sometimes God, etc.	Occurs in insanity (functional).
		209 Double personality	At intervals the patient is in a sort of somnambulistic state and presents an abnormal consciousness and personality. His memory at times changes with his personality, in which case he remembers only occurences in former similar conditions and not those of his normal state, and vice versa. This is a very rare condition and offers much opportunity for deception, and in some cases of hysteria may well be suggested by the examining physician.	Occurs in hysteria and epilepsy (functional).
		210 Automatism Somnambulism	A person performs complicated and apparently intelligent acts, while suffering from loss, or great impairment, of consciousness, and retains little or no memory of the acts done.	Brain is probably anemic or exhausted, or the patient is under the influence of a great emotion (fright). Occurs in epilepsy, insanity, hypnotism, and rarely in hysteria (functional); not uncommon in childhood during sleep.

INTELLIGENCE

		Diagnostic Symptoms	Definition	Significance
202 INTELLIGENCE	DIMINISHED	211 Amentia	Absence or defect of intelligence, which is congenital or is acquired ln infancy before the intelligence has developed.	Due to a malformed or diseased brain. Occurs in idiots, imbeciles and feeble minded persons.
		212 Dementia	Absence or defect of intelligence, which is acquired in later life in a person previously intelligent.	Due to atrophy or functional failure of cerebral cortex. Occurs in insanity and is often its terminal stage.
	PERVERTED	213 Hallucinations	Vivid perceptions of sensations (visual, auditory, olfactory, tactile, painful, etc.) directly dependent neither upon memory nor upon any external corresponding reality. They are usually regarded as real and are then associated with defective judgment and mental impairment.	Due to disease of the cerebral cortex, whether functional, circulatory, toxic or organic. Usually symptoms of insanity, or of extreme degree of neurasthenia, are also present. In insanity these perversions of intelligence cannot be corrected by reason and demonstration, and in neurasthenia only rarely and imperfectly.
		214 Illusions	Erroneous perceptions. A false interpretation of an actual sensation, which is really of a different nature from that which the patient believes it to be. Frequently occur in rational persons, especially in those with defective terminal sensory organs. In such cases easily corrected.	
		215 Delusions	Erroneous judgments (often, but not always, dependent upon hallucinations) which can be corrected neither by reason, nor by the evidence of the senses and which are not in accord with universal human experience, and are the consequence of mental enfeeblement.	
		216 Hypochondriasis	Delusions of imaginary symptoms and illness formed on an insufficient basis of abnormal sensations, which cannot be corrected and are associated with much mental depression.	
		217 Delirium	Irrational talk in persons with diminished consciousness. Probably due in most cases to hallucinations; consequently its irrationality may be only apparent. Often occurs in fevers.	
		218 Compulsory ideas and actions	Certain thoughts or questions or doubts, which are forever in the patient's mind and cannot be removed. They may be of any nature. Patients are irresistibly compelled by an unknown force to do certain acts or to say certain words, usually quite trivial. Patients recognize the abnormal character of these ideas and acts and are made very unhappy by them, but are quite unable to prevent them.	

Methods for the detection of disorders of consciousness and intelligence are described in Chart I.

For further discussion of these symptoms and the diseases in which they occur see Chart XVI.

Chart III b

Disorders of Memory and Emotions

In all forms of aphasia, agraphia, alexia, psychic blindness, deafness, etc., whether so stated in the text of this chart or not, the lesion is always in the left cerebral hemisphere in right handed persons and in the right cerebral hemisphere in left handed persons.

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

MEMORY

	Diagnostic Symptoms	Definition	Significance
203 MEMORY DIMINISHED	220 Amnesia	Inability to recall former perceptions and ideas. Loss of memory in general. May be more or less extensive. May affect memories of the immediate, or of the remote, past.	Functional or organic disease of the cerebral cortex, often anemia, sometimes the result of fright.
	221 Motor aphasia	Inability to express by words some idea in the patient's mind, although there is no paralysis of the vocal organs and the patient can usually express the idea by gesture. A loss of memory of how to speak (innervation memories), especially names. A limitation of the vocabulary.	Lesion in or near base of left inferior frontal convolution in right handed persons, and of the right inferior frontal convolution in left-handed persons.
	222 Sensory or Auditory aphasia (word deafness)	Inability to understand (although not deaf) spoken words formerly intelligible. Loss of memory of words formerly heard. Hence inability to recognize them when spoken (233).	Lesion in or near posterior part of left superior temporal convolution in right handed persons.
	223 Optic aphasia	Inability to name objects, which the patient sees clearly, although he can name them after feeling them. Loss of visual memories (232).	Lesion of left occipital lobe or of association fibers from this lobe in right handed persons.
	224 Mixed aphasia	A mixture of the three forms of aphasia just described.	Any one or a combination of the above lesions, or a lesion of island of Reil. or of external capsule, or carelessness in right handed persons.
	225 Paraphasia (Jargon speech)	The use of a wrong word, or the omission of a word, or the placing of the right word in the wrong place, in speaking, with consequent incoherent speech.	
	226 Paragraphia	The use of a wrong word, or the omission of a word, or the placing of the right word in the wrong place, in writing.	
	227 Agraphia	Inability to express in writing the idea in the patient's mind, although he formerly could do so and his right arm and hand are not paralysed.	Lesion in the base of the middle left frontal convolution, cortical or subcortical.
	228 Alexia (Word blindness)	Inability to read words patient could formerly read, although he sees them clearly and there is no paralysis of his vocal organs.	Sub-cortical lesion beneath left angular convolution in right handed persons.
	229 Astereognosis	Inability to recognize objects by the sense of touch, although there is no anesthesia present in sufficient degree to prevent it.	Lesion in or near cortex, or sub-cortex, of contralateral posterior central convolution.
	230 Apraxia	Inability to execute a desired act. Loss of skill in executing acts, although there is no motor paralysis present. Loss of innervation memories necessary to perform these acts.	Cortical, or sub-cortical, lesion of motor area of contralateral hemisphere.
	231 Agnosia	Inability to recognize objects through some organ of sense which is itself normal. This may be due to failure of full perception or to loss of special memories.	Cortical, or sub-cortical, lesion of sensory area of cortex of contralational cerebral hemisphere.
	232 Psychic blindness	Inability to recognize well known objects or to comprehend familiar things by sight, although the patient is not blind. Loss of visual memories, optic aphasia (223).	Cortical, or sub-cortical, lesion of left occipital lobe, except in region of calcarine fissure.
	233 Psychic deafness	Inability to recognize and comprehend well known words and sounds, although the patient is not deaf. Loss of auditory memories. Includes sensory aphasia (222).	Cortical, or sub-cortical, lesion in left superior temporal convolution in right handed persons.

EMOTIONS

		Diagnostic Symptoms	Definition	Significance
204 EMOTIONS	EXAGGERATED	234 Sadness (Melancholia)	Without adequate cause the patient is depressed and unhappy. There is a great repression of mental and physical activity usually. He can be influenced little, if at all, by reason; difficult to get his attention.	Functional or circulatory disturbance of cerebral cortex, especially cerebral exhaustion. Occurs in neurasthenia and especially in insanity. Fears and apprehension seem to be the basic symptoms of many forms of incipient insanity (Mosher).
		235 Fear (Phobias)	Without adequate cause the patient is in constant fear of an impending calamity, or has an unformulated fear. He dreads to cross an open space (agoraphobia), or to enter a small room or confined space (claustrophobia), or fears a storm (astrophobia), or syphilis (syphilophobia), or ill-timed urination (cerophobia), or everything (pantophobia), etc. Can be influenced little, if at all, by reason. Frequently has a more or less unconscious sexual basis.	
		236 Joy (Mania)	Without adequate cause the patient is exhilarated. There is great exuberance of mental and physical activity. Careless and destructive. Can be influenced little, if at all, by reason. Difficult to get his attention.	
	DIMINISHED	237 Apathy	Without adequate cause patient is in a dull stuporous condition. No expression of physical or mental activity. An automaton, submitting passively to whatever is done for him.	

Methods for the detection of disorders of memory and emotion are described in Chart I.

For further discussion of these symptoms and of the diseases in which they occur see Charts XII and XVI.

Chart IV—Disorders of Voluntary Motion

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

Definition, Significance and Relationship of the Symptoms of Disease.

240
DISORDERS OF VOLUNTARY MOTION

The power of executing movements by an effort of will is acquired in early life. The process is quite obscure, but seems to depend upon the existence of innervation memories of past acts, primarily reflex. Voluntary motion depends upon the integrity of the central motor neurons (461) and of the peripheral motor neurons (462). In disease the power of voluntary motion may be diminished, exaggerated or perverted.

MUSCULAR TONICITY

Closely connected with the power of voluntary and involuntary action is the fact that the muscles of a normal person are in a condition of constant, slight, but varying, contraction. This is called muscular tonicity or tone. It is really a reflex act caused and maintained by many slight irritations, and can be abolished by cutting the posterior nerve roots. Muscular tonicity is increased: "hypertonia" in destructive lesions of the central motor neurons and in some functional disorders. It is diminished: "hypotonia," or abolished: "atonia," in destructive lesions of the peripheral motor or sensory neurons, in lesions of the cerebellum, in sleep and in narcosis.

241
DIMINUTION
also called
AKINESIS and HYPOKINESIS

244
PARALYSIS
A condition in which the muscles cannot be con-contracted by the strongest effort of the will. As commonly used the term includes:

PARESIS
A condition in which the muscles can be contraced only feebly by the strongest effort of the will.

The conditions under which paralysis or paresis occur are set forth in Chart IV a.

242
EXAGGERATION
also called
HYPERKINESIS

245
TONIC SPASM
A continuous, involuntary, muscular contraction of longer or shorter duration (572).

246
CLONIC SPASM
More or less rhythmical alternations of involuntary, coarse, violent muscular contractions and relaxations (571).

247
IRREGULAR SPASM
Involuntary acts of various kinds (292, 573-4).

The conditions under which the various forms of spasm occur are set forth in Chart IV b.

243
PERVERSION
also called
PARAKINESIS

248
ATAXIA
Disorderly movements due to loss of power of coordination (638). Asynergia. Associated with hypotonia (252)

249
LOSS OF SKILL, APRAXIA
Awkwardness.

250
TREMOR
Involuntary rhythmical oscillation of some part of the body or of a muscle. Less powerful and more rhythmical than a clonic spasm but similar in appearance, especially when coarse. Tremor may be slow (5 to 6 per second) or rapid (8 to 12 per second). It may be coarse or fine (639).

The conditions under which the various forms of perversion of motion occur are set forth in Chart IV c.

Chart IVa
Motor Paralysis

244 PARALYSIS { CHARACTER / EXTENT

MOTOR PARALYSIS

PARALYSIS

CHARACTER

Diagnostic Symptoms	Definition	Significance
251 Spastic, or hypertonic, paralysis. (473).	A paralysis in which the muscles show increased tone and offer much resistance to passive motion, especially rapid motion. The normal excursion of the joint is restricted. The muscles have their normal volume and under the microscope their fibers show a normal appearance. The electrical reaction of muscle and nerve is normal (396). The tendon reflexes are increased.	Destructive lesion of central motor neurons (461). It occurs in diseases of the brain or spinal cord, or may be functional. Rarely a reflex spasm (268), especially preputial irritation in children, or pain, may simulate this condition.
252 Flaccid, or hypotonic, or atonic, or atrophic paralysis (472).	A paralysis in which the muscles have lost their tone and offer little or no resistance to passive motion, even when rapid. The joint has a normal or even increased excursion. The muscles exhibit a great and rapid atrophy, and under the microscope their fibers show a loss of their transverse striation and various forms of degeneration (fatty, hyaline, etc.). The electrical reaction of degeneration is present (399). When muscles are completely degenerated passive contractures (263) may occur. The tendon reflexes are abolished or diminished.	Destructive lesion of peripheral motor neurons (462). It occurs in diseases of the muscles, peripheral nerves, anterior horns of cord, or motor nuclei in brain stem. It is never functional, but may be somewhat simulated by joint disease. Hypotonia without muscular paralysis or atrophy occurs in cerebellar lesions, tabes and other ataxic conditions (240).
253 Myasthenic paralysis (563)	A rapid tiring of muscles upon exercise. A myasthenic reaction to electricity (401). Muscles show small foci of small round cells.	A lesion of the muscles and often of thymus gland.

MOTOR PARALYSIS (Continued)

PARALYSIS

EXTENT

Diagnostic Symptoms	Definition	Significance
254 Hemiplegia (478-9)	A paralysis with exaggerated tendon reflexes, of one lateral half of the body and extremities limited by the median line in front and behind. It is partial, if limited to arm and leg; complete, if arm, leg, tongue, palate and face are all involved. In some cases of hemiplegia there is slight weakness and exaggerated reflexes on the other side of the body also, especially in the leg. Symmetrical, bilateral muscles, which have a common function and a bilateral cortical innervation, are not paralysed; at most temporarily weakened. Such are the ocular, masticatory, laryngeal, respiratory, bladder, rectal, etc., muscles. In cerebral hemiplegia certain muscles are, in most cases, more completely paralysed than others. These "predilection muscles of Wernicke" are the trapezius, the external rotators and adductors of the upper arm, the triceps, the supinators and abductors of thumb, the extensors of the thigh, the flexors of the leg and the dorsal flexors of the foot.	A lesion of the contralateral central motor neurons (461). In extremely rare cases the lesion may be homolateral (homolateral hemiplegia), in which cases the pyramidal tract may not decussate in the medulla. Hemiplegia is usually due to a cerebral lesion, but the partial form may be due to a bulbar or spinal lesion, very rarely. Very rarely, there may be no lesion, except an extreme local anemia or edema of brain as in nephritis (hemiplegia sine materia).
255 Diplegia (478)	A double hemiplegia involving both sides. May be complete or partial and not infrequently is limited to the legs, or the face (facial diplegia), etc.	A lesion, usually but not always cortical, of the central motor neurons or basal nuclei on both sides.
256 Crossed paralysis (537-42) (Hemiplegia alternans)	A paralysis of one or more homolateral cranial nerves and of the contralateral arm and leg.	Always due to a lesion involving the pyramidal tract with other structures in the brain stem (460); either in the medulla (hypoglossal hemiplegia alternans (1268)), the pons (facial hemiplegia alternans (1269)), or in the crus cerebri (motor oculi hemiplegia alternans (1270)). The nuclei, or the neurons, peripheral or central, of the cranial nerves are involved below the decussation of their central neurons.
257 Paraplegia (480)	A symmetrical paralysis of both sides of the body. Usually only involves the legs and lower part of body, but may involve the arms and even both sides of the face.	May occur in lesions of the muscles (dystrophies) (477), or of the peripheral nerves (neuritis (488-9)), or of the spinal cord or brain stem, or even of the cerebral cortex (bilateral lesion). The distinction between paraplegia and diplegia (255) is not always sharply drawn.
258 Monoplegia (479)	A paralysis of one extremity only, or of one half of the face only.	May be due to lesion of motor cerebral cortex, or of the motor nuclei, or of the peripheral nerves.
259 Local paralysis (481)	A paralysis limited to one or more muscles of the face, eye, mouth, neck, body or extremities. Less than a whole extremity.	May be due to lesions of muscles or of peripheral nerves, or of spinal cord, or rarely of motor cerebral cortex, or functional.
260 Aphonia (737-8)	Inability to produce vocal sounds. Absence of voice. A variety of local paralysis.	Laryngeal paralysis, organic or functional.

Methods for the detection of paralysis and paresis are described in Chart I.

For further consideration of these symptoms and of the diseases in which they occur, see Chart X.

Chart IV b

Spasm

SPASM

	Diagnostic Symptoms	Definition	Significance
245 TONIC SPASM	263 Passive contracture	A continuous contraction of long duration in which the muscles, tendons and ligaments have become anatomically shortened and cannot be extended by force, even under etherization. The muscle fibers are degenerated, while the connective tissue of the muscle is hypertrophied and usually secondarily contracted, as in other newly formed connective, or scar tissue.	Due to muscular lesions and to degeneration of the peripheral motor neurons (462).
	264 Active contracture	A continuous contraction lasting weeks, months, or years, which can be overcome by force, either with or without etherization. Muscles are in a normal condition of nutrition. Most common in the arms, or legs, or neck muscles (torticollis). The active contracture of a hemiplegia is usually that of flexion in the arm and of extension in the leg.	Active contractures occurring in hemiplegia affect the muscles not absolutely paralyzed. When the contracture is overcome by the application of a plaster of Paris splint, the muscles often show a surprising degree of voluntary motion, when the splint is removed. These contractures depend in part, on attempts at voluntary movements and on associated movements, but in greater part on reflex action from sensory irritation; the inhibitory action of the brain being cut off by the lesion. They never occur in hemiplegia in tabetics and in any case can be relieved by section of the posterior nerve roots. Such contractures are always of very bad prognosis as to recovery. Active contracture is sometimes due to paralysis of antagonist muscles or to muscle lesions. All tonic spasms (not including passive contracture) are due to a functional disorder or are reflex (especially in children) or are due to irritation (chemical, sensory or vascular) of central motor neurons (461). Painful cramps, especially in legs, of the nature of myotonia or tics, may be due to a deficiency of water in the system.
	265 Myotonia (613)	An active contracture of brief duration but much longer than a convulsive tic. It may occur at the commencement of voluntary motion (Thomsen's disease, or myotonia congenita) or may be excited by cold (Eulenberg's disease, or paramyotonia congenita). It is frequent in meningitis and tetanus in which it takes many forms, viz: "retraction of head;" "trismus," strong closure of jaw; "opisthotonus," arching of body backwards; "pleurosthotonus," bending of body to one side; "emprosthotonus," arching of body forwards and "orthotonus," holding of body rigid and straight.	
	266 Rigidity	An active contracture of such mild degree that it does not prevent passive, or even voluntary, motion of the part, although rendering it difficult (paralysis agitans (612)), etc.	
	267 Convulsive tics (601)	A violent spasm of momentary duration. If rapidly repeated it must be classed under myoclonus (270 and 601). If painful, it is called "tic douloureux" (602).	
	268 Reflex spasm	A spasm, usually tonic, caused by irritation of some sensory tissue.	
246 CLONIC SPASM	269 Convulsion (478)	Violent clonic contractions of many, or of all the, muscles of the body.	Clonic spasms are usually due to irritation of cerebral cortex.
	270 Myoclonus or convulsive tics	Successive clonic contractions of one, or of a few adjacent muscles. Repeated convulsive tic. Most common in the face muscles (blepharospasm (601)).	

	Diagnostic Symptoms	Definition	Significance
247 IRREGULAR SPASMS	271 Athetosis or mobile spasm (574)	Slow, worm-like, rhythmical movements, often associated with transitory contractures (spasmus mobilis), of fingers and wrists and more rarely of toes and ankles. Hyperextension is the predominant action. Usually unilateral, but may be bilateral. Much more common in children than in adults.	Lesion is usually in posterior part of optic thalamus or corpus striatum of contralateral hemisphere and not causing complete paralysis. Lesion may involve the fibers connecting the optic thalamus with the cerebral cortex. May occur in diffuse cortical lesions.
	272 Choreic movements Chorea minor (573)	Rapid, irregular, co-ordinated, but purposeless movements caused by contraction now of one group of muscles, now of another, throughout the body; bilateral or unilateral (hemichorea). Cease during sleep. They often render voluntary movements ataxic and are usually associated with a mild degree of paralysis of the muscles involved.	
	273 Chorea major or magna (628)	Patient performs involuntarily and uncontrolably a complicated and apparently purposeful movement. Also applied to a coarse tremor or violent oscillation of a part of the body.	Functional disorders, occurring in the neuroses and in insanity.
	274 Habit chorea (626)	Patient frequently performs involuntarily, and usually unconsciously, the same act. Usually a small act.	
	275 Compulsory acts	Patient is compelled by some power within him which he cannot understand or explain to perform certain acts against his will.	
	276 Associated movements	Muscular contractions, occurring when movements are executed or attempted, in muscles not directly concerned in the movement attempted; often the corresponding muscles of the opposite side of the body, often those of the face. Such associated movements are Bell's phenomenon (444), Strümpell's tibialis phenomenon (445), Babinski's associated movements in unilateral paralysis (446).	In such cases movements often associated together, but which can be easily dissociated voluntarily in health, cannot be dissociated in disease which cuts off voluntary action.

Methods of detection of spasm are described in Chart I.

For further discussion of these symptoms, and of the diseases in which they occur, see Charts XI and XII.

Chart IV c

Perversions of Motion

Ataxia, Loss of Skill, Tremor

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

ATAXIA—LOSS OF SKILL

	Diagnostic Symptoms	Definition	Significance
248 ATAXIA	280 Motor ataxia (644) (dynamic ataxia)	Voluntary movements are executed in an irregular and disorderly manner, which is due to a loss of the co-ordinating power. Rarely associated with decided vertigo.	Is due to a loss of muscle sense (42) (deep sensibility). May be due to lesions of peripheral sensory nerves, or of posterior columns of cord, or of brain stem, or of cerebral cortex posterior to fissure of Rolando, or may be toxic (alcohol), or functional.
	281 Cerebellar ataxia (642) (static ataxia)	Walking and standing are inco-ordinate, but other acts are not, or only slightly so. Patient executes simple movements of his legs fairly well when lying in bed, but in walking and standing he lacks synergy of the muscles and staggers and sways like a drunken man. Usually associated with vertigo (392).	Is due to a lack of muscular synergy (41) (asynergy). Due to lesion or functional disorder of the cerebellum or its tracts, including the direct cerebellar tract in brain stem or cord, or to tumors in frontal lobe of brain, or to disease of ears or eyes, or to poisons (alcohol, etc.). In lesions of the cerebellar hemisphere the disorder is transitory; in lesions of the worm it is more permanent.
249 LOSS OF SKILL	282 Apraxia	Inability, or difficulty, in performing a desired and accustomed act because of loss, or derangement, of the innervation memories concerned in that act. Loss of skill.	Loss of innervation memories, general or partial, due to cortical or subcortical lesions, or to functional or anemic disorders of cerebral cortex.
	283 Anarthria (737)	Complete inability to speak.	May be either functional or organic and then may or may not be due to lesions in the organs of speech. If not, it is called pure motor aphasia or aphemia.
	284 Dysarthria (738)	Such difficulty in articulation that speech becomes indistinct and blurred.	Occur in lesions of the medulla and pons (bulbar paralysis) and of the cranial nerves. Also in diphtheria, hydrophobia, myasthenia gravis, rarely in trichinosis and frequently in hysteria (globus hystericus).
	285 Dysphagia	Difficulty in swallowing.	
	286 Dysmasesis (563)	Difficulty in mastication.	
	287 Astasia and Abasia (653 and 675)	Complete inability to stand or walk but legs can be moved freely when lying or sitting.	A delusion or auto-suggestion, which occurs in hysteria. May occur rarely in cerebellar lesions.
	288 Diadocokinesia (36)	Difficulty in repeating a movement rapidly, especially supination.	Occurs in lesions of a cerebellar hemisphere, or is functional.

TREMOR

	Diagnostic Symptoms	Definition	Significance
250 TREMOR	289 Passive tremor (646 and 647)	Involuntary, rhythmical oscillation or trembling of a part which is otherwise at rest.	Functional. Occurs in paralysis agitans, weakness, etc.
	290 Intention tremor (645)	An involuntary tremor which only occurs when a voluntary motion is made, or is willed and is about to be made.	Functional and organic. Occurs in neuroses and in organic diseases (disseminated sclerosis)
	291 Nystagmus (640)	An involuntary trembling or oscillation of eyeball, usually horizontal, rarely vertical, very rarely rotatory. Increased, or only occurs, on voluntary motion of eyeball, especially on extreme deviation. The rapidity of the oscillations varies from 60 to 200 per minute. Their amplitude from 2 to 4 millimeters. Nystagmus may be oscillatory when the motion in each direction is equally rapid, or rhythmic when it is quicker in one direction than in the other.	Occurs especially in lesions of Deiter's nucleus in the cerebellum, of the posterior longitudinal bundle in the brain stem, in disturbances in the semi-circular canals, and in weakness of ocular muscles, and in lesions of ponto-cerebellar angle.
	292 Fibrillary contraction or fibrillation (641)	An involuntary contraction of a bundle of fibers of a muscle of short duration. When many occur in adjacent bundles at short intervals, waves of contraction run over the muscle, but do not cause it to contract as a whole.	Degeneration of those multipolar nerve cells in the anterior horns of the spinal cord and brain stem of which the motor nerves supplying the muscle are the axons. Rarely occurs in traumatic neuroses.
	293 Myokymia (697)	A fibrillary twitching of the muscles occurring in healthy persons.	Normal. Exhaustion. Following excessive muscular contraction or exposure to cold.

Methods of detection of perversions of motion are described in Chart I.

For the further discussion of these symptoms and of the diseases in which they occur, see Chart XII.

Chart V—Reflex Activity

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

Definition, Significance and Relationship of the symptoms of disease.

296 REFLEX ACTS An involuntary movement caused by irritation of a sensory nerve or terminal organ. Although not the result of conscious intention, yet these acts seem purposeful and usually tend towards the protection of the body. In order that a reflex act may take place there must be a comparatively healthy reflex arc, consisting of a motor nerve, a sensory nerve and some gray matter connecting the two; or, in other words, a motor neuron and a sensory neuron connected together directly or by a bridging neuron. Reflex acts are inhibited and modified by inhibitory impulses passing down from the brain along the so-called inhibitory fibers, which are also the central motor neurons (the pyramidal tract) (472-4, 810).	297 CUTANEOUS OR SUPERFICIAL REFLEXES A reflex act which originates from an irritation of the skin (57).	The conditions in which reflex acts are disordered are set forth in Chart V a.
	298 MUCOUS MEMBRANE REFLEXES A reflex act which originates from an irritation of a mucous membrane (58).	
	299 TENDON OR DEEP REFLEXES A reflex act which originates from the sudden stretching of the fibers of a muscle (60-6).	
	300 ORGANIC REFLEXES A reflex act affecting one of the viscera of the body (1), especially the bladder or rectum.	
	301 VASO-MOTOR REFLEXES A reflex act affecting the arterioles (59).	
	302 PUPILLARY REFLEX A reflex act affecting the pupil (25-7).	The conditions in which the pupillary reflexes are disordered are set forth in Chart V b.

Chart Va

Cutaneous or Superficial Reflexes, Mucous Membrane Reflexes, Tendon or Deep Reflexes, Organic Reflexes, Vaso-Motor Reflexes

CUTANEOUS REFLEXES

Diagnostic Symptoms	Definition and Location of Reflex Centers	Significance
303 Plantar	Plantar flexion of the toes when the sole of the foot is irritated. (1st and 2nd sacral segments.)	The abnormal reflexes, Babinski, Gordon and Oppenheim reflexes and ankle-clonus, always indicate disease of the central motor neurons (461), except in infants, in whom these reflexes (except ankle-clonus) may be present normally, and in some cases of hysteria in which an imperfect ankle-clonus may rarely be obtained. The Babinski reflex is most reliable in a diagnostic sense. The Oppenheim reflex is sometimes present when the Babinski is absent and vice versa. Kernig's sign indicates meningitis or meningismus; it is an important, but not a certain, diagnostic sign. Alterations in the tendon reflexes are of very much greater diagnostic value than are those of the cutaneous (except the Babinski) reflexes, which are in many cases inconstant, probably because the cutaneous reflex impulses may even pass through the gray matter of the brain (cerebellum) as well as through a wide area of that of the spinal cord. Diminution of reflexes is usually of little diagnostic value, but their abolition is of great value and may be due to a destructive lesion of any part of the reflex arc (a peripheral motor neuron, a peripheral sensory neuron, or a central bridging neuron). When there is a lesion of the peripheral motor neuron, atrophic motor paralysis is present in addition to the loss of the reflex. When there is a lesion of the peripheral sensory neuron there is usually a sensory paralysis (anesthesia, etc.), in addition to the loss of the reflex. Diminution or abolition of reflex activity may occur, at least temporarily, in acute diseases or other forms of irritation of the central motor neurons; also in cases of shock, exhaustion, coma, narcotism and after epileptic fits, (except Babinski); also by will power and by voluntary movements of the muscles concerned; also (except Babinski) in cases of complete separation of the brain from the spinal cord, and, rarely, of increased intracranial pressure, also frequently in fevers. The abolition of the knee-jerk is of great diagnostic importance. It is absent in tabes, neuritis (multiple and crural), acute anterior poliomyelitis involving the thigh, Landry's paralysis, lesion of the cauda equina or of the lumbar enlargement, during the attack of family periodic paralysis, after an epileptic attack and in cases of muscular dystrophy involving the extensor cruris muscles. The knee-jerk is abolished throughout the course of Friedreich's ataxia and combined sclerosis except in the early stages when it may be increased.
304 Babinski's	Sluggish extensive dorsal flexion of the great toe when the sole of the foot is irritated.	
305 Gordon's	Dorsal flexion of the great toe when deep pressure is made through the calf muscle on the deep flexor muscles beneath; the leg being completely relaxed.	
306 Oppenheim's	Dorsal flexion of the great toe elicited by firm stroking with a hard object, or finger, just behind the postero-internal border of the tibia from above downwards; the leg being completely relaxed.	
307 Gluteal	Contraction of the buttocks when the skin covering them is irritated. (4th and 5th lumbar segments.)	
307a Anal	Contraction of sphincter ani upon pin pricks of anus. (5th sacral segment.)	
308 Cremasteric	Drawing up of the testicle when the inner side of the thigh is irritated. (1st to 3rd lumbar segments.)	
309 Umbilical	Sudden movement of umbilicus towards the side of abdomen irritated. (8th to 12th dorsal segments.)	
310 Epigastric	Sudden retraction of epigastrium when the hypochondrium is irritated. (7th to 9th dorsal segments.)	
311 Interscapular	Drawing inwards of the scapula when the skin of the interscapular space is irritated. (5th cervical to 1st dorsal segments.)	
312 Corneal or conjunctival	Closing of the eyelids when the cornea or conjunctiva is irritated. (5th to 7th cranial nuclei.)	
313 Nasal	Sneezing when the nasal membrane is irritated. (5th to 10th cranial and upper cervical nuclei.)	

MUCOUS MEMBRANE, TENDON, ORGANIC AND VASO-MOTOR REFLEXES

Diagnostic Symptoms	Definition and Location of Reflex Centers	Significance
314 Uvular	Raising of the uvula in phonation or upon irritation of its mucous membrane. (9th to 10th cranial nuclei.)	Exaggeration of the reflexes may be due to a mild inflammation, or to any irritation, of any part of the reflex arc. Strychnine increases reflex activity by irritating the nerve cells in the anterior horns. More commonly the reflexes are increased by any lesion of the motor central neurons, thus cutting off the normal inhibitory influence of the brain, and are then associated with paralysis of voluntary motion. The presence of ankle-clonus, the Babinski reflex and the dorsal foot reflex indicates a lesion of the pyramidal tract much more certainly than does an exaggerated knee-jerk. Very commonly the reflexes are increased in functional diseases (hysteria) and in nervousness.
315 Pharyngeal	Retching or gagging when the pharynx is irritated. (9th to 10th cranial nuclei.)	
316 Ankle-clonus	Oscillation of the foot when the ball of foot is pressed quickly and continuously upwards. (5th lumbar and 1st sacral segments.)	
317 Achilles reflex	Sudden plantar flexion of foot when the tendo - Achillis is sharply struck. (1st to 2nd sacral segments.)	
318 Knee-jerk	Sudden extension of knee when the ligamentum patellae is sharply struck. When this reflex is exaggerated it is usually accompanied by a contraction of the adductors of the opposite thigh. (2nd to 4th lumbar segments.)	Innervation of the muscles not concerned in the reflex act and diverting the attention increases reflex activity (reinforcement, 68). The paradoxical reflex is of no diagnostic importance. It consists in a contraction of the tibialis instead of the calf muscles when ankle-clonus is tested for; also of a contraction of the flexors instead of the extensors of the thigh when the knee-jerk is tested for.
319 Kernig's sign	Resistance to sudden extension of the knee.	
320 Dorsal foot reflex	Sudden plantar flexion of the toes when the dorsum of the foot over the 4th and 5th metatarsal bones is struck. (5th lumbar and 1st sacral segments.)	
321 Elbow and wrist reflexes	Sudden extension or flexion of elbow or wrist when the corresponding tendons are sharply struck. (5th to 7th cervical segments.)	
322 Maxillary reflex	Sudden closure of jaw when it is sharply struck downwards. (5th cranial nucleus.)	Inability to void urine, or to retain it, is sometimes due to nervousness and sometimes to mechanical obstruction (enlarged prostate or stricture), but any other serious disturbance of the organic reflexes indicates organic disease of the nervous system. It never occurs in diseases of peripheral nerves, except in lesions of the cauda equina, and rarely in cerebral disease. It is most common in spinal disease; sphincter paralysis with empty bladder and constant dribbling of urine in lesions of lumbar enlargement, and detrusor paralysis with distended bladder and often with dribbling of urine in lesions above the lumbar enlargement.
323 Bladder or vesical reflex	The retention of urine in the bladder by the sphincter reflex, and the expulsion of urine by the detrusor reflex and the synchronous relaxation of the sphincter. (Hypogastric sympathetic ganglia.)	
324 Rectal reflex	Similar to that of the bladder. (Hemorrhoidal sympathetic ganglia.)	
325 Ischemic reflex	A sudden pallor of the skin following an irritation and limited to the area of irritation.	
326 Paralytic, hyperemic reflex (dermographia)	Congestion of the skin following the ischemia due to irritation; (tâches cérébrales and dermographia).	Vaso-motor disturbances cause a disturbance of the nutrition of a part. Diseases which result from, or are associated with, disturbances of the vaso-motor reflexes are discussed in Chart XVII.

The methods of eliciting the various reflexes are described in Chart I.

Diseases in which the reflexes are altered are discussed in Charts X, XIV, XVI, XVII.

Chart V b

Pupillary Reflexes

PUPILLARY REFLEXES

302 PUPILLARY REFLEXES

Diagnostic Symptoms	Definition and Location of Reflex Centers	Significance
330 Pupillary reaction to light (25)	Pupil contracts when light is thrown on retina of the same eye (direct reflex), and when light is thrown on retina of opposite eye (consensual reflex), and dilates when retina is shaded from light (ciliary ganglion).	The pupillary reaction to light is diminished or absent in lesions of the reflex arc (optic nerve, corpora quadrigemina, the Westphal-Edinger cell group of the motor oculi nucleus, third nerve and ciliary ganglion), especially in lesions of the ciliary ganglion. When the optic nerve or corpora quadrigemina are involved the consensual reflex can not be obtained from the other (healthy) eye. It is absent in blindness, deep sleep, narcosis, shock, coma, epileptic, and occasionally in hysterical, attacks; also absent in tabes, in many cases of paresis and in rare cases of syphilis alone; absent also when eye is under the influence of mydriatics or myotics.
331 Pupillary reaction to accommodation (27)	Pupil dilates when patient looks at a distant object and visual axes are parallel and contracts when patient looks at a near object and eyes converge.	The pupillary reaction to accommodation is absent (cycloplegia) in lesions of the third nerve, sometimes after diphtheria, occasionally in alcoholism and when the eye is under the influence of mydriatics or myotics, also in myopia and in cases of deficient convergence.
322 Argyll-Robertson's phenomenon	Pupil does not respond to light, but does respond to efforts at accommodation.	The Argyll-Robertson's phenomenon occurs in almost all cases of tabes and paresis (in many of these cases a degeneration of the posterior columns of the cord has been found at autopsy) and very rarely in cases of syphilis in which there are no manifestations of either tabes or paresis for years afterwards. The reverse of the Argyll-Robertson's phenomenon, i.e., the preservation of the light reflex and the loss of the accommodation reflex, occurs occasionally in diphtheritic paralysis and has been found associated with syphilis, basal meningitis, tumors of corpora quadrigemina and myelitis. It is extremely rare.
333 Immobile pupil	The pupil responds neither to light nor accommodation, but in some cases may still dilate slightly on irritation of cervical sympathetic.	Immobile pupil may occur in lesions of the optic nerve or tract or in its nucleus or in that of the third nerve or in the ciliary ganglion or its nerve. It may also be associated with ophthalmoplegia externa or interna or both. When it occurs alone it is due to a lesion in the nucleus. Immobile pupil also occurs in tabes, in epilepsy, in some forms of hysteria, in fainting, and in katatonic stupor.
334 Hemiopic reflex (26)	Pupil contracts when light is thrown on the unparalysed half of retina, but does not contract when light is thrown on paralysed half.	The hemiopic reflex occurs only in lesions of the optic tract or geniculate bodies (homonymous hemianopia) or of the central part of the optic chiasm (bitemporal hemianopia). The existence of this reflex is disputed by many observers.

PUPILLARY REFLEXES (Continued)

302 PUPILLARY REFLEXES—CONTINUED

Diagnostic Symptoms	Definition and Location of Reflex Centers	Significance
335 Cilio-spinal reflex (465)	Pupil dilates when neck on same side is irritated or when cocaine is dropped in the eye. (Cervical sympathetic ganglion.)	The cilio-spinal pupillary reflex is absent in lesions of the cervical sympathetic, and in many lesions of the medulla and lower cervical and upper dorsal region of the spinal cord (cilio-spinal center—465).
336 Hippus	When the eye is suddenly exposed to light, there occurs a series of alternate contractions and dilatations of the pupil, gradually growing less in degree.	Hippus is usually associated with a general exaggeration of reflexes.
337 Westphal's pupil reaction	When patient's eyelids are held forcibly apart and he attempts to close them he not only turns the eyeball upwards (Bell's phenomenon) but also the pupil contracts.	Westphal's pupillary reaction occurs in some cases of tabes and in paresis.
338 Paradoxical pupillary reflex	Pupil dilates instead of contracting upon exposure to light or upon efforts of accommodation.	The paradoxical pupillary reflex is of no diagnostic significance. It has been observed in tabes and in paresis and is the result of fatigue.
339 Mydriasis	Dilated pupils.	Mydriasis may be irritative or spasmodic, due to irritation of the cervical sympathetic ganglion or nerve; or may be paralytic, due to paralysis of the third cranial nerve or the ciliary ganglion; or may be due to both causes. It occurs in children, and on taking certain drugs (mydriatics). It occurs also from irritation of the cervical sympathetic *directly* by incipient lesions in the cervical enlargement of the spinal cord and its membranes, or by tumors in the neck, or by excess of carbonic acid in the blood as in dyspnoea; and *indirectly* by strong emotions and especially by pain; also in paralysis of the sphincter pupillae (iridoplegia) from lesions, such as optic atrophy, glaucoma, lesions of the third nerve, or ciliary ganglion, which break, or impair, the reflex arc and which usually cause more or less diminution of vision and a deficient perception of light; also in coma, in cases of increased intra-cranial pressure, and in some other cerebral and meningeal lesions, especially in their later stages.
340 Myosis	Contracted pupils.	Myosis may be irritative or spasmodic, due to irritation of the third nerve or ciliary ganglion; or may be paralytic, due to paralysis of the cervical sympathetic ganglion or nerve, or may be due to both causes. It occurs in old age, in deep sleep, or on taking certain drugs (myotics); also from irritation of the third nucleus or nerve, as in meningitis in early stages and especially in hemorrhage into the pons; and from excessive use of accommodation, as in watchmakers, etc.; also from paralysis of the sympathetic in lesions of the neck and of the spinal cord (syringomyelia). It occurs often in tabes, paresis, iritis, irritation of cornea and, temporarily, after excision of the Gasserian ganglion.
341 Unequal pupils or anisocoria	One pupil is larger than the other when the eyes are at rest.	Aniscoria occurs in many conditions and is of little or no diagnostic value.

The methods of eliciting the pupillary reflexes are described in Chart I.
Diseases in which these reflexes are altered are discussed in Chart XIV.

Chart VI—Disorders of Sensation

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)
Definition, Significance and Relationship of the Symptoms of Disease.

344 DISORDERS OF SENSATION

The power of receiving perceptions of the external world and of the occurrences in our own body (the basis of all knowledge) is acquired early in life. The nature of the process is entirely unknown, but it rests upon the power of storing up memories and of recalling them at will. It depends upon the integrity of the central and peripheral sensory neurons (463-4), as well as upon that of the terminal sensory organs and of the cerebral cortex (47 to 56). This power may be diminished, or exaggerated, or perverted in various diseases.

345 DIMINUTION

Either no perception or an abnormally feeble one follows a sensory irritation adequate in health to cause a perception (805, 810).

346 EXAGGERATION

An unusually strong perception, as compared with health, follows any sensory irritation (806).

The conditions under which sensation may be diminished or increased are set forth in Chart VI a.

347 PERVERSION

The occurrence or modification of a perception such as never occurs in health (930).

The conditions under which sensation is perverted are set forth in Chart VI b.

Chart VI a

Diminution and Exaggeration of Sensation

SENSATION

	Diagnostic Symptoms	Definition	Significance
345 DIMINUTION	348 Anesthesia (complete) or Hypesthesia (partial). (Superficial sensibility)	A loss, or diminution, of the normal sensibility to touch upon adequate irritation. Normal sensibility varies in acuteness in different parts of the body and in different individuals.	Diminution of sensibility may be due to disease of the terminal end organs, or to a destructive lesion either of the peripheral sensory neurons (464), (in which case all forms of sensibility are abolished over an area usually coinciding with, but smaller than, the distribution of a peripheral nerve, and the reflex acts in the same part are also abolished); or of the sensory central neurons (463), (in which case frequently all forms of sensibility are not abolished, and the anesthetic area does not correspond to the area of distribution of a nerve, and the reflex acts in the part are not abolished). Sensibility is abolished in coma, narcosis and often apparently in hysteria. A broad zone of analgesia, and more rarely, of anesthesia also, about the body occurs in locomotor ataxia "tabetic cuirass." The anesthetic area may coincide with the distribution of a peripheral nerve or with that of a nerve root (peripheral lesion); or with the distribution of several nerve roots (spinal lesion); or the area may involve one-half the body: called hemianesthesia (cerebral lesion and hysteria). Anesthesia of one side of the face and of the opposite arm and leg, "crossed hemianesthesia," occurs in lesions in the tegmentum of the pons. Anesthesia may involve some portion of the body supplied by small branches of many different nerves, such as a hand, a foot, a leg, a forearm, etc., and be sharply limited "stocking and glove variety" (hysterical).
	349 Analgesia or Hypalgesia	A loss, or diminution, of the normal sensibility to pain, which in health varies in different individuals and in different parts of the body.	
	350 Thermic Anesthesia or Hypesthesia	A loss, or diminution, of the sensibility to variations in temperature. This loss may be more marked for cold than for heat and vice versa.	
	351 Loss of pressure sense	Inability to distinguish differences in the amount of pressure made on the skin.	
	352 Loss of muscle and joint sense or Akinesthesia. (Deep sensibility)	Inability to tell how strongly a muscle is contracted, whether a joint is flexed or extended, or where an extremity is situated in space. A very complex sensation.	
	353 Apallesthesia or loss of osseous sense or vibration sense.	Inability to feel the vibration of a tuning fork pressed firmly on the skin.	
	354 Astereognosis	Inability to recognize objects by the sense of touch; anesthesia not being present.	Analgesia, thermic anesthesia and apallesthesia may be due to lesion of the central gray matter, or of the antero-lateral ascending tract, of the cord.
	355 Deafness or Anakusia or Hypakusia	Loss, or diminution, of sense of hearing.	Astereognosis always indicates a lesion of the cerebral cortex.
	356 Anosmia or Hyposmia	Loss, or diminution, of sense of smell.	Anakusia, anosmia, ageusia and blindness, may be due to a lesion of the sensory terminal organ, of the sensory nerve or tract, or may be functional. But these symptoms may occur in so many conditions unconnected with the nervous system that they may have very little diagnostic value in nervous diseases.
	357 Ageusia or Hypogeusia	Loss, or diminution, of sense of taste.	
	358 Blindness or Anopsia or Amaurosis	Loss of vision.	Hemeralopia associated with a central scotoma for green and red is not uncommon in tobacco smokers; so that when the pupil is dilated in a dim light the healthy part of the retina can act.
	359 Amblyopia	Decided impairment, but not complete loss, of vision, especially for colors in the early stages. Usually in such cases the field of vision is made small by the loss of more or less of its periphery or by scotomata.	Nyctalopia is at times associated with congenital retinitis pigmentosa, with cortical (peripheral) cataract and with other defects in the eye.

	DIAGNOSTIC SYMPTOMS	DEFINITION	SIGNIFICANCE
DIMINUTION	360 Hemeralopia	A condition in which the patient sees better in a dim light than in a bright one; (day blindness).	
	361 Nyctalopia	A condition in which the patient sees well in a bright light but is almost blind in a dim one; (night blindness).	
	362 Hemianopia	Loss of one-half of the field of vision.	Homonymous hemianopia is due to a lesion of the optic tract posterior to the chiasm, of the geniculate bodies, the optic fasiculus or the median surface of the occipital lobe of the opposite side of the brain (lips of calcarine fissure). Bi-temporal hemianopia is due to a lesion of the central part of the optic chiasm. Nasal hemianopia is due to a lesion of the lateral margin of the optic chiasm. Bi-nasal hemianopia cannot result from one lesion.
	Homonymous	Loss of the same half in both fields.	
	Nasal	Loss of the nasal half in each or either field.	
	Bi-temporal	Loss of the temporal half in both fields.	
	363 Tetartanopia or Quadrantic Hemianopia	Loss of an homonymous quadrant of both fields of vision.	Tetartanopia is due to a lesion of the upper lip of the contralateral calcarine fissure if it be a lower quadrant and of the lower lip of this fissure if it be an upper quadrant. Very rarely to a partial lesion of the geniculate bodies or optic fasiculus.
	364 Achromatopsia or color blindness. Hemichromatopsia	Inability to distinguish the different colors from each other either throughout the whole, or in one-half the field of vision.	Achromatopsia may be due to a congenital defect or to defective education or may be the early stage of a gradually developing blindness or amblyopia. Due to mild, not completely paralysing, lesions of any portion of the visual tract in the broad sense.
	365 Dissociation of sensation	Loss of some forms of cutaneous sensibility (usually for pain and temperature) with preservation of others (tactile).	Dissociation of sensation always indicates a lesion of the central gray matter (syringomyelia) or of the lateral columns of the spinal cord, or more rarely a lesion in the ponto-cerebellar angle of the pons at the level of the auditory nerve. It occurs associated with motor paralysis of the opposite side of the body in some cases of Brown-Séquard's paralysis.
346 EXAGGERATION	366 Hyperesthesia	Increased tactile sensitiveness. An unusually slight touch can be perceived. A very rare and even doubtful condition. It is usually employed when a touch causes an unusually great, even painful sensation, where hyperalgesia or haphalgesia (336) would be a better term.	Exaggeration of sensibility of all kinds is usually functional. More rarely it is the result of an irritative, rather than a destructive, lesion of the central or peripheral sensory neurons. It occurs in strychnine poisoning and tetanus. Hyperesthesia occurs as a zone at the upper limit of the anesthesia in many spinal lesions, and on the same side of the body as is the lesion in Brown-Séquard's paralysis. It is usually associated with increased reflex activity.
	367 Hyperalgesia	Increased sensitiveness to pain.	
	368 Thermic Hyperesthesia or Hyperalgesia	Increased, even painful, sensitiveness to heat or cold, or both.	
	369 Hyperosmia	Increased, even painful, sensitiveness to odors.	
	370 Hypergeusia	Increased and unpleasant sensitiveness to taste.	
	371 Photophobia	Increased and painful sensitiveness to light.	Photophobia is functional, or due to eye strain, or to inflammation of some part of the eye, or optic nerve, or cerebral meninges.
	372 Hyperakusia	Increased, even painful sensitiveness to sounds.	Hyperakusia is functional, or due to ear diseases affecting the labyrinth, or to cerebral conditions causing hyperemia of the labyrinth (meningitis, encephalitis, tumors, etc.) and to spinal affections.

Methods for the detection of these conditions are described in Chart I.
Diseases in which these conditions occur are discussed in Chart XIV.

Chart VI b

Perversions of Sensation

SENSATION

347 PERVERSION

Diagnostic Symptoms	Definition
374 Pain	Is an unpleasant sensation not felt in perfect health, except in cases of injury. It varies greatly in intensity. It presents different qualities, such as: tearing, cutting, burning, throbbing, darting etc. It may be diffuse, or felt in a small area (localized), or may run along a nerve trunk (radiating), or may run half way or entirely about the body or an extremity (girdle), or it may be felt in an area which is itself anesthetic (anesthesia dolorosa). Pains may vary as to time of occurrence, some showing a distinct periodicity (malaria, neuralgia and migraine), some occur at menstrual epochs. Some headaches occur in morning (uremic), others in afternoon (ocular) and others towards evening and at night (syphilitic). Some pains are increased by pressure (neuritis and neuralgia) while some are diminished by it (lead colic).
375 Paresthesiae	Curious sensations rarely felt in perfect health, usually unpleasant but not severe enough to be called pain. They are numbness, tingling, formication, heat, cold, heaviness, tired feeling, hunger, etc.
376 Failure of localization (Topoanesthesia)	When a cutaneous sensation is felt but cannot be localized.
377 Allocheiria	When an irritation is not felt at the point of contact, but at a corresponding point on the opposite side of body.
378 Double sensation and Polyesthesia	Where one contact gives rise to two distinct sensations (double sensation) or more (polyesthesia).
379 Paradoxical sensation	The quality of thermic sensation is reversed, a hot body feels cold and vice versa.
380 Haphalgesia	A slight tactile impression from certain objects, but not from others, is felt as intense pain.
381 Retardation of conduction of pain	The sensation of pain is not felt until an appreciable interval after the time of contact.
382 Persistence of sensation	The sensation continues an unusually long time after the irritation causing it has ceased to act.

Significance

Perversions of sensibility, especially pain and paresthesiae, are often functional and are often due to irritation (pressure, chemical, inflammatory, etc.) of central or peripheral sensory neurons. Radiating and girdle pains are usually due to lesions of the nerve roots. Anesthesia dolorosa is due to a lesion of the central end of a sensory neuron which has been destroyed below this point and therefore can conduct no sensations from below.

Although pain may be felt as peripheral it may be of central origin and due to lesions of central neurons within the brain or cord. On the other hand pains due to lesions in the abdominal viscera may be referred to remote parts of the body or the head (referred pains 952).

Failure of localization may be functional but usually results from lesions of the peripheral sensory neurons (tabes).

Allocheiria occurs in hysteria; very rarely in any other disease.

Polyesthesia occurs only in tabes and in hysteria.

Paradoxical sensation has been met with in a number of spinal and cerebral diseases, but is without diagnostic significance.

Haphalgesia occurs in hysteria.

Retardation of conduction of pain occurs only in lesions of peripheral sensory neurons (tabes or multiple neuritis).

Persistence of sensation occurs in lesions of the peripheral sensory neurons (tabes).

Binocular diplopia is due to a weakness of one or more of the external muscles of one eye, or to displacement of one eyeball; so that the image does not fall on identical spots in the two retinae.

PERVERSION (Continued)

Diagnostic Symptoms	Definition	Significance
383 Binocular Diplopia (697)	Two separate visual perceptions of the same object, the perception from the normal eye (true image) being more distinct than that from the abnormal eye (apparent image).	Monocular diplopia may occur in hysteria, in cases of double pupillary opening, in anomalous refraction (incipient cataract), and irregularities in the cornea.
384 Monocular Diplopia or Polyopia (697)	A condition in which objects appear double or multiple, even when looked at with one eye alone.	Metamorphosia may occur in hysteria, also in astigmatism (refractive) and in displacement of the retinal elements (retinal) which may occur in retinitis, choroiditis, and in detachment, or tumor, of retina.
385 Metamorphopsia	A condition in which objects appear distorted.	
386 Micropsia	A condition in which everything looks much smaller than normal.	Micropsia may occur in hysteria, in paralysis of accommodation and, with distortion, when the retinal elements are spread apart (recent choroiditis or retinitis).
387 Macropsia	A condition in which everything looks much larger than normal.	Macropsia may occur in hysteria, in spasm of accommodation and, with distortion, when the retinal elements are crowded together (atrophic stage of retinitis and choroiditis).
388 Tinnitus Aurium	A sound of ringing, roaring, whistling, etc., in ears or head.	
389 Parakusis	Perversions of hearing, such as hearing tones incorrectly or hearing better when other loud noises are present at the same time, or hearing sounds or words for which there is no external cause (hallucination).	Tinnitus aurium, parakusis, parosmia and parageusia occur in lesions of the terminal organ and in insanity and functional disorders. They may constitute the aura of an epileptic attack.
390 Parosmia	The perceptions of abnormal odors or of those for which there is no external cause (hallucination).	Vertigo may be functional (hysteria, neurasthenia, traumatic neuroses); or may depend on changes in the cerebral circulation, especially anemia and hyperemia (cardiac and arterial diseases, congestion in portal or systemic circulation, galvanism of head or neck), or toxic (tobacco, morphine, alcohol, some digestive disturbances, etc.); or may depend on diseases of the cerebellum and its tracts, or of the ear or eye. It is the principal symptom in Ménière's disease (aural vertigo). Vertigo is closely associated with vomiting. In vertigo associated with lesions in, or pressing upon, a cerebellar hemisphere, external objects seem to whirl in the direction away from the injured hemisphere in both conditions, but the subjective vertigo is away from the injured hemisphere in case the lesion is within it and towards it when the lesion is external and presses upon the hemisphere.
391 Parageusia	The perception of abnormal tastes or of those for which there is no external cause (hallucination).	
392 Vertigo	A feeling as if the person (subjective) or as if surrounding objects (objective) were whirling about, or both.	

Diseases in which these conditions occur are discussed in Charts XIV and XV.

Chart VII a
Electrical Examination

ANALYSIS OF THE OBJECTIVE SYMPTOMS OF THE CASE (SEMEIOLOGY)

Definition, Significance and Relationship of the Symptoms of Disease.

	Name of the Reaction	Tissue Tested	Reaction to Faradism	Reaction to Galvanism and Formula of Galvanic Reaction	Character of the Contraction	Significance of the Reaction
395 ELECTRICAL REACTION OF MUSCLES AND NERVES Nerve fibers respond to changes in intensity of both the faradic and the galvanic currents. The changes in intensity are best brought about by making and breaking the current. Muscle fibers respond only to the galvanic current. The muscle responds to the faradic current only in virtue of the nerve fibers supplied to it. When these nerve fibers are degenerated the muscles can no longer respond to the faradic current. Both nerves and muscles have points on the body surface; the so-called motor points (see figures 1 to 5) from which they are most readily excitable. Therefore, in testing a nerve or muscle by electricity the electrode (positive or negative) is placed on the corresponding motor point (64 and 67).	396 Normal excitability (473)	NERVE AND MUSCLE	Contraction present to a strength of current which is normal for the nerve and muscle tested.	Neg.Cl.C. Pos.Cl.C. Pos.Op.C. Neg.Cl.Tet. is the normal formula, or in other words Neg.Cl.C. occurs with the weakest current that will cause any contraction. Neg.Cl.C. Pos.Cl.C. with a little stronger current. Neg.Cl.C. Pos.Cl.C. Pos.Op.C. with a still stronger current. The explanation of the above formula is as follows: The weakest current that will cause any contraction of the muscle will do so when the negative electrode is on the motor point and the current is closed. (Neg.Cl.C.) A more powerful contraction will take place when a stronger current is used and then there will also be a contraction when the current is closed and the positive pole is on the motor point (Pos.Cl.C.). A still more powerful current causes a contraction when the current is opened and the positive electrode is on the motor point (Pos.Op.C.). With such powerful currents and the negative pole on the motor point there results a tetanus or continuous contraction when the current is closed, (Neg.Cl. Tet.); so that the muscle cannot relax to contract again when the current is opened. There is, therefore, in health no reaction corresponding to "Neg.Op.C."	Quick.	Normal excitability shows a normal condition of muscle and nerve.
	397 Diminished excitability		Contraction present but it requires an unusually strong current to produce it.			Diminished excitability occurs in many diseases and conditions, especially in lesions of the central motor neurons and is not of much value in diagnosis.
	398 Exaggerated excitability		Contraction present to an unusually weak current.			Exaggerated excitability is a rare condition. It occurs in nervous persons with moist skins and in tetany.
	399 Reaction of degeneration (472)	NERVE	Gradual loss of excitability which becomes complete in about two weeks after injury or onset of the disease.	No reaction.	None.	The reaction of degeneration proves that the peripheral motor neurons are degenerated and that recovery will either never take place, or will be very slow. The lesion must be either in the peripheral nerves, or nerve roots, or in the anterior horns of the spinal cord, or in the motor nuclei in the brain stem.
		MUSCLE	Gradual loss of excitability which becomes complete in less than two weeks after injury or onset of the disease.	After the first two weeks the muscle responds to unusually feeble galvanic currents and the normal formula is reversed; the positive pole being more potent. Pos.Cl.C. Neg.Cl. C. Pos.Op.C. Neg.Op.C. (which last reaction never occurs in health). It is usual to express the formula for the normal reaction and for the reaction of degeneration in the German language in which Kathode means the negative electrode and Anode means the positive electrode. The usual normal formula is K.C.C., A.C.C., A.O.C., K.C.Te. The reaction of degeneration is A.C.C., K.C.C., A.O.C., K.O.C. The essence of the normal formula is K.C.C.>A.C.C. The essence of the formula of the reaction of degeneration is A.C.C.>K.C.C.	Sluggish. The sluggish character of the muscular contraction is the most characteristic thing in the reaction of degeneration.	

ELECTRICAL REACTIONS (Continued)

	Name of the Reaction	Tissue Tested	Reaction to Faradism	Reaction to Galvanism	Formula of Galvanic Reaction	Character of the Contraction	Significance of the Reaction
395 ELECTRICAL REACTION OF MUSCLES AND NERVES	400 Partial reaction of degeneration	Nerve	Contractions present, but require unusually strong currents, whether faradic or galvanic.		Either the normal formula, or the formula of the reaction of degeneration, or a combination of the two may be present. K.C.C. may equal A.C.C.	Quick or sluggish	The significance of this reaction is the same as that of the reaction of degeneration, except that it indicates the lesion is less severe and that all the nerve fibers are not degenerated.
		Muscle	Contractions present only to unusually strong currents.	Contractions present to unusually weak currents		Sluggish.	
	401 Myasthenic reaction (563)	Nerve and Muscle	Contractions quickly grow less strong and soon cease under rapidly repeated excitation.	Normal	Normal.	Quick, grows rapidly weaker and ceases.	Occurs only in myasthenia gravis (563).
	402 Myotonic reaction (613)	Nerve and Muscle	Continuous tonic contraction lasting some time after the electrical stimulation has ceased.	Curious wave-like contractions occur, and last after electrical stimulation has ceased.	Positive pole is about equally as potent as the negative. Hence the formula A.C.C. = K.C.C.	Continues usually a long time and has a wave-like character.	Occurs in Thomsen's disease (613).
	403 Neurotonic reaction	Nerve	Unusually excitable. Tetanic contraction persists after electrical stimulation has ceased.		Normal.	Continuous	Occurs in hysteria, amyotrophic lateral sclerosis and chronic bulbar paralysis.
		Muscle	Normal.	Normal.			
	404 Reaction of completely degenerated muscle (70 to 73)	Muscle	None.	None.	None.	None.	Muscle fibers are entirely degenerated and recovery is impossible.

405 Electrical reaction of the Optic and Auditory Nerves

The optic nerve responds to the galvanic current with a sensation of light, the color of which varies with the pole employed.

The auditory nerve responds with a loud sound when the negative electrode is placed in or near the meatus and the current closed and with a faint sound when the positive pole is used and a stronger current broken. These reactions are without diagnostic importance.

The negative electrode placed in front of the ear causes a nystagmus towards the ear tested when the current is closed and in the opposite direction when the current is broken. The positive electrode causes nystagmus in exactly the reverse direction.

In cases of disease in which the caloric test (78) is absent and in which the electric test is present, it is fairly certain that the lesion is in the labyrinth and not in the nerve. If there is no response to either the caloric or the electric test the lesion is in the nerve or its nucleus.

Chart VII b

Erb's Motor Points for Electrical Examination of Nerves and Muscles

The Motor points are the areas upon the surface of the body at which the individual nerves and muscles can be most easily excited by electricity. For the nerves, these points coincide with those at which the nerve lies most superficially or where it can be pressed against a resisting tissue; for the muscles, they lie over the point of entrance of the nerve into the muscle.

ERB'S MOTOR POINTS

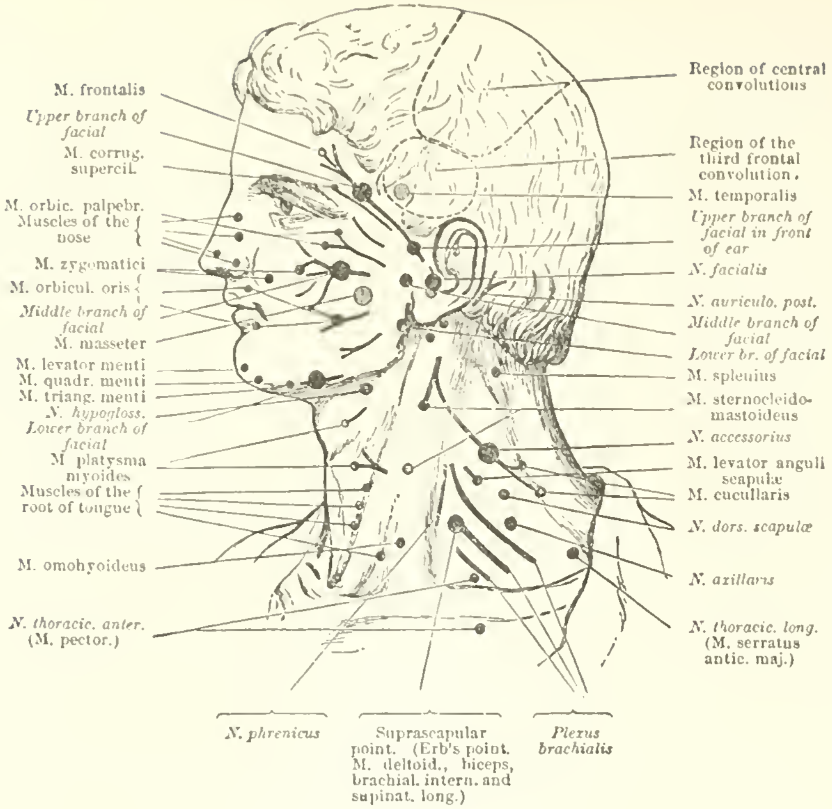

Fig. 1

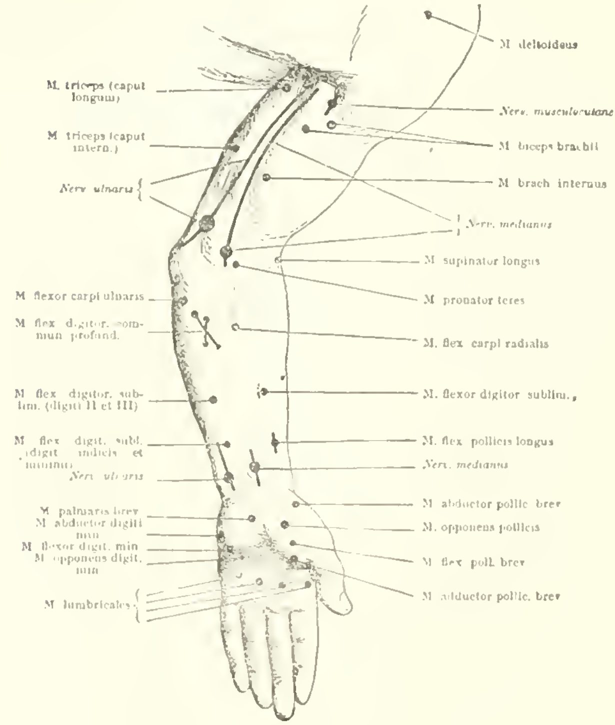

Fig. 2

ERB'S MOTOR POINTS (Continued)

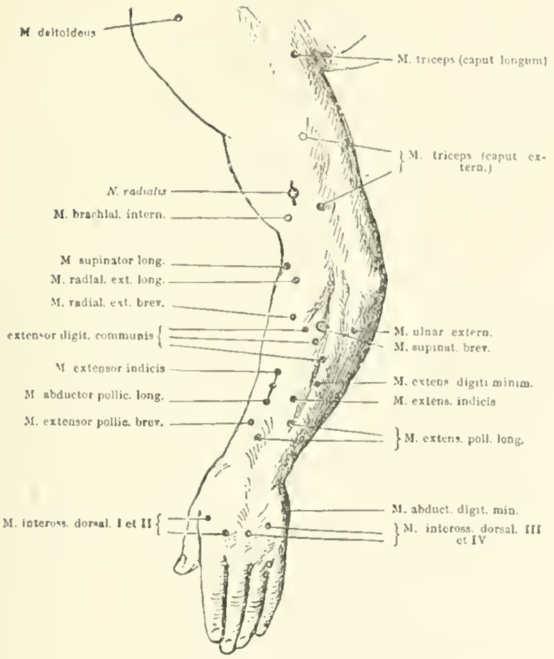

Fig. 3

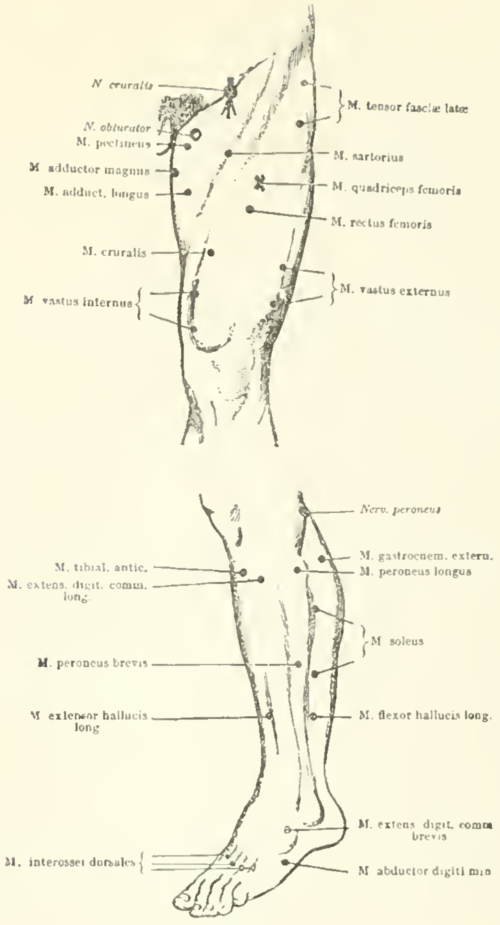

Fig. 4

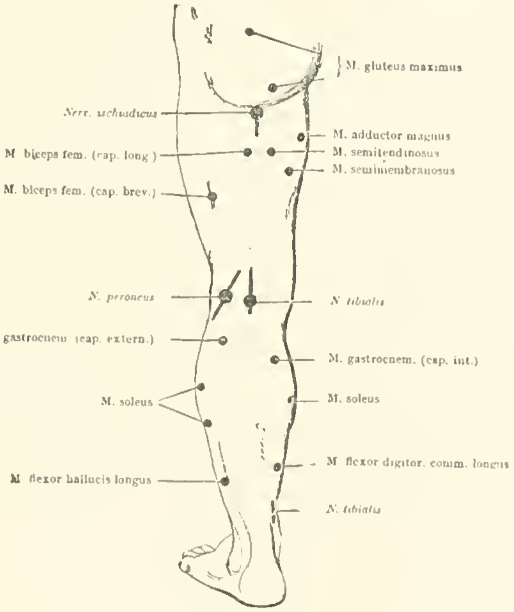

Fig. 5

Chart VII c

ERB'S DIAGRAM SHOWING THE EFFECTS OF INJURY OF A NERVE

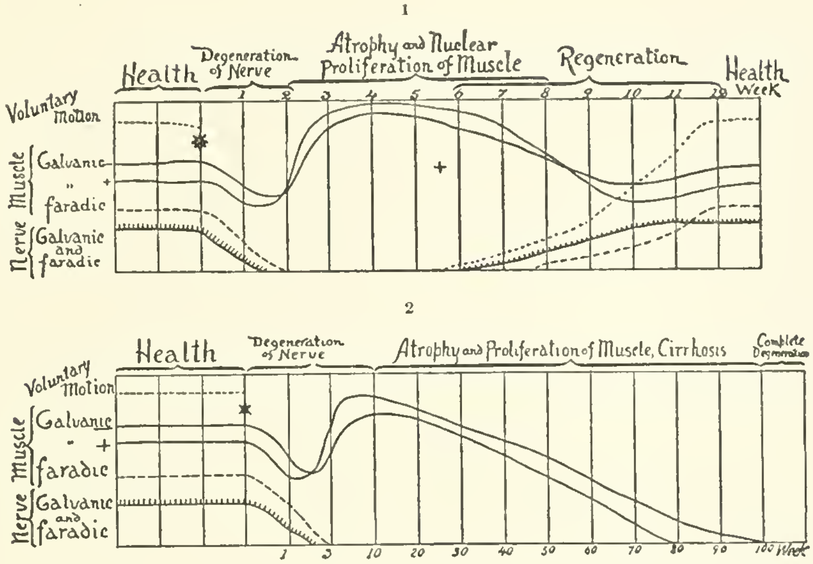

FIG. 6

Charts Illustrating the Reaction of Degeneration

The star (*) indicates the incidence of a paralysing lesion in the domain of the peripheral neuron. Voluntary motion is lost at once. During the first two weeks there is slight diminution of the galvanic excitability of muscle; there is also rapid diminution of the faradic excitability of muscle and of the galvanic and faradic excitability of nerve, which are completely lost at the end of the second or third week. During the second week there is rapid increase in galvanic excitability of muscle and the response to the positive pole becomes greater than to the negative.

Chart 1 represents the reaction in a case terminating in recovery. During the sixth week (indicated by the cross X) regeneration begins. The increased galvanic excitability of the muscles gradually diminishes until it becomes normal and the poles are reversed so that the negative response is again greater than the positive. Voluntary motion returns first, then the galvanic and faradic excitability of the nerve, and last of all, the faradic excitability of the muscles.

Chart 2 represents the reaction in a case terminating in atrophy and cirrhosis of the muscle. The galvanic excitability of the muscle is increased and the poles are reversed, as before. The decline in galvanic excitability continues, however, until the end of the second year, when it is entirely lost. Voluntary motion, and the electrical reactions of both muscles and nerve are thus permanently destroyed.

Chart VIII

Analysis of the Cerebro-Spinal Fluid

ABNORMAL CEREBRO-SPINAL FLUID

	Characteristics	Method of Testing	Significance
410 ABNORMAL CEREBRO-SPINAL	411 Tension	Can be roughly estimated by the rapidity of flow of fluid through the canula, whether in drops or a stream, more accurately by the height to which the fluid rises in a vertically held glass tube connected by a short rubber tube with the canula. A stopcock on the canula adds to the accuracy by preventing the escape of much fluid and the consequent lowering of the tension. The fluid in the tube rises and falls with the respiration. An additional more rapid and stronger pulsation indicates a basilar aneurism.	A low or very rapidly diminishing tension has no diagnostic meaning, except as indicating an obstruction to the communication of the fluid in the ventricles with that of the vertebral canal, as in closure of the foramen of Magendie. A high tension means increased intra-cranial, or intra-spinal, pressure caused by an increased amount of cerebro-spinal fluid or by a foreign body within the cerebro-spinal cavity. It occurs in tumors, abscess, hydrocephalus, hemorrhage, acute, subacute, some cases of chronic, and serous meningitis, also in cerebral edema (nephritis, anemia, etc.), acute infectious diseases and some other conditions.
	412 Red color or 413 reddish yellow color	By sight. Hematoidin crystals may be seen under the microscope.	Fresh blood in the fluid may be the result of puncture of a blood vessel, in which case it is most abundant in the fluid first drawn, usually coagulates, and settles quickly on centrifugalization. Or, May be the result of hemorrhage into the ventricles or membranes. Hemorrhage, haematoma, aneurism, etc.
	414 Cloudy	By sight. Pus cells under the microscope. Polymorpho-nuclear leucocytes.	An increase of cellular elements in the fluid is usually the result of an acute or sub-acute meningitis. In some cases of acute meningitis, however, the fluid may be clear.
	415 Clear with delicate coagulum	By sight.	Tuberculous meningitis, usually.
	416 Cellular elements and bacteria	Fluid soon after withdrawal should be centrifugalized. Tube should be emptied quickly and from its walls and bottom sediment should be sucked in and out of a capillary tube, well mixed and spread on two clean slides. One slide should be stained by Gram's method for bacteria, and the other by Wright's blood stain for cellular elements. Or, The fluid (not centrifugalized), 10 parts, can be mixed with 1 part of a solution consisting of methylene blue 0.2%, glacial acetic 4.0%, and water to 100 %, and counted in a Thoma-Zeiss chamber.	The normal cerebro-spinal fluid shows under these conditions 1 to 3 cells in a field of the microscope. If there are more than 4 to 6 cells in a field it indicates a meningitis. If the cells are mainly leucocytes it indicates epidemic cerebro-spinal, or purulent meningitis, or rarely an acute tuberculous meningitis. Broadly speaking, an acute infectious meningitis. If the cells are mainly or entirely lymphocytes it indicates a tuberculous meningitis, or cerebro-spinal syphilis, or paresis, or tabes, or acute anterior poliomyelitis, or convalescence from any form of acute meningitis. Broadly speaking a chronic infectious meningitis. If echinococcus cysts or hooklets are present, they indicate the presence of an echinococcus cyst.

ABNORMAL CEREBRO-SPINAL FLUID (Continued)

	Characteristics	Method of Testing	Significance
FLUID	417 Sugar	By Haines' test or other tests.	Not of much significance, but the sugar normally present is diminished usually in meningitis and in some other conditions.
	418 Albumen	Two cc. of the fluid mixed with 10 cc. of Esbach's fluid is centrifugalized during one hour in a conical tube graduated to 0.1%.	Normally not more than ½% is present. Usually increased in meningitis and tumors. A diminution in the amount usually indicates a progressive space-occupying disease. Of little diagnostic significance.
	419 Globulin	Two cc. of a saturated solution of chemically pure neutral ammonium sulphate should be placed in a test tube and one cc. of the cerebro-spinal fluid should be gently run upon its top. If the reaction is positive, within 3 minutes, a grayish white ring should form at the junction of the two fluids. At the end of one-half hour, the surface of the ring should show a delicate network. Best seen by indirect illumination. Or, Boil slightly 1 volume of the cerebro-spinal fluid with 5 volumes of a 10% butyric acid solution, and 1 volume of a normal solution of sodium hydroxide, reheat and allow to cool. If a flocculent precipitate forms, the reaction is positive. (Noguchi test).	Indicates meningitis, acute anterior poliomyelitis, cerebro-spinal syphilis, paresis, tabes, rarely a brain tumor.
	420 Positive Wassermann reaction	This test can only be performed in a laboratory by an expert.	The reaction is positive in 90% of cases of paresis and in 60% of cases in tabes. In cerebro-spinal syphilis both the cerebro-spinal fluid and the blood usually give a positive reaction. In other cases of syphilis (without meningitis) the reaction is usually negative with the cerebro-spinal fluid, but positive with the blood.

Chart IX

Special Syndromes and Anatomical Terms

SYNDROME	DEFINITION	SIGNIFICANCE
425 Hysterical symptoms (1076)	Occur usually in self-conscious females of an emotional nature. Lack of inhibition and great susceptibility to suggestion. Desire to excite admiration and sympathy and wonder. Mental instability. Globus hystericus (426). Spinal, inguinal (or ovarian) and other tenderness. Great variety of symptoms (especially subjective) which cannot be explained by any organic lesion. Glove and stocking form of anesthesia or hemianesthesia and concentric contraction of the field of vision are common symptoms, but the patient is usually ignorant of their existence until they are discovered, or more probably suggested, by the physician. Exaggerated reflexes but no ankle-clonus or only pseudo-clonus. Never a Babinski reflex. Motor paralyses, tremors, contractions and convulsions are not uncommon. Transference of hemianesthesia can be effected in some cases. The anesthesia of the fingers does not prevent delicate acts being done by them with eyes closed. Such patients when tested and the anesthetic area is touched often answer "no" at the moment of contact (48). Many other symptoms do not seem to be real but rather seem to be imaginary and may result from hallucinations or delusions or more probably are the result of suggestion: auto-, or foreign. Probably many of the hysterical symptoms come into existence as the result of the physician's careful and minute examination or repeated examinations (foreign suggestion).	Hysteria (1076)
426 Globus Hystericus (1076)	The feeling of a lump or ball behind the upper end of the sternum which interferes both with swallowing and breathing. The sensation often commences in the epigastrium and rises to the base of the neck and remains there; the patient not being able to get it up or down. It may be caused by a spasmodic contraction of the muscles of oesophagus or throat.	
427 Hysterogenic areas (1076)	Spots scattered over the body, but usually in the left inguinal region, where light pressure or irritation will cause more or less violent hysterical attacks.	
428 Hysterofrenic areas (1076)	Spots scattered over the body, but usually in the left inguinal region, where firm and continued pressure will cause the arrest of an existing hysterical attack.	
429 Lasègue's symptom (1076)	A condition in which the patient cannot move an anesthetic extremity when her eyes are closed, but can move it readily when she opens her eyes and looks at it.	
430 The epileptic aura (575, 1058)	The aura is a symptom (warning) which occurs before the attack in about half the cases of epilepsy. It may be remote or immediate. The former is often called "a prodromal symptom" and occurs hours and days before the attack. It consists usually in an emotional change (irascibility, etc.), changes in the amount of sleep, of food taken, in sexual desire and vasomotor phenomena. Much more characteristic and important is the immediate aura which occurs a fraction of a minute before the attack. This aura may be "psychic" (anxiety, anger, joy, dreamy states, special thought or memory, etc.), or a "sensory hallucination" which may be visual (blindness, lights, colors (red), elaborate false visual perceptions, etc.), or auditory (deafness, noises, and false auditory perceptions), or olfactory or gustatory hallucinations, or cutaneous paresthesiae (the feeling of a wind blowing on some part of the body is quite common) and pains, or visceral paresthesiae, especially epigastric. Vertigo is a common immediate aura; or the immediate aura may be motor and consist in twitching of a group of muscles, (Jacksonian epilepsy), or in more complicated automatic movements of the body, or in hiccough, sneezing, yawning or swallowing. Vasomotor disturbances, flushing or pallor with secondary paresthesiae, are not uncommon immediate aurae. Usually the aura is always the same in the same individual; rarely it varies. In rare cases the aura may not be followed by an attack and in still rarer and always doubtful cases it may be the only symptom of epilepsy.	Epilepsy (575, 1058)

Syndrome	Definition	Significance
431 Jacksonian epilepsy (587-8, 605)	A clonic spasm of one or more muscles in one side of the face or in one arm or leg, which may remain local, but usually rather rapidly extends to other muscles of the same side of face, or of the arm or leg in which it commenced. It then may extend to an adjacent extremity in the same order in which the cortical centers are placed: thus from the face to the arm and then to the leg, from the leg to the arm and then to the face, from the arm to the leg and face nearly or quite simultaneously, but never from the face to the leg, or vice versa, without involving the arm. When the spasm has extended over the whole half of the body it may remain so or may jump across and involve the other side. As long as the spasm is local or limited to one-half of the body consciousness may or may not be lost, but when the spasm involves both sides of the body consciousness is always lost.	Local cortical lesion (587-8, 605)
432 The prodromata of apoplexy (504, 1060-3)	In many cases of apoplexy, especially in cases of cerebral thrombosis, the apoplectic attack is preceded by a number of more or less definite and characteristic symptoms which may be remote, preceding the attack by months or years, or immediate, occurring immediately before the attack. These prodromata are both general, such as headache, vertigo, drowsiness and stupor, irritability, forgetfulness, hypochondriacal feelings, ringing in the ears, flashes before the eyes, etc., and local, such as temporary attacks of aphasia, diplopia, achromatopsia, dysarthria, temporary paralysis of arm, etc., paresthesiae, etc. None of these symptoms is so characteristic that an attack of apoplexy can be confidently predicted from its presence. The most constant prodromal symptom of apoplexy (except embolism) is high arterial tension.	Apoplexy (504, 1060-3)
433 Tabetic or visceral crises (661)	Paroxysmal attacks of pain in, and functional disturbances of, some viscera, occurring in the course of locomotor ataxia. These attacks recur after irregular intervals, persist during an hour, or a day or two, and are analogous to the paroxysmally occurring lightning-like pains in the legs. "Gastric crises" are the most frequent and consist in severe pain in the epigastrium together with uncontrollable vomiting and retching. At times attacks of gastric pain or of vomiting occur separately. "Hepatic crises" resemble gallstone colics, even being accompanied by slight jaundice at times. "Laryngeal crises" consist in attacks of coughing and dyspnoea. "Laryngeal vertigo" (Ictus laryngeus) consists in a sensation of tickling and burning in the larynx, a stridulous inspiration with a feeling of suffocation and a falling to the ground unconscious for a few minutes. "Pharyngeal crises" consist in repeated acts of noisy swallowing. "Renal crises" resemble attacks of renal colic. "Vesical crises" consist in pain in region of bladder and prostate, and constant desire to urinate. "Urethral crises" consist in attacks of pain in urethra and desire to urinate. "Rectal crises" consist in attacks of pain in the rectum and tenesmus. "Vulvo-vaginal crises" consist of attacks of pain in vagina. "Clitoridian crises" consist of attacks of pain in vulva with sexual desire and discharge of mucus. "Anginal crises" resemble angina pectoris. Occasionally "crises" of several kinds occur simultaneously.	Tabes (661)
434 Bulbar symptoms (546)	A combination of several or all of the following symptoms, dysarthria or anarthria (283-4), dysphagia (285), drooling of saliva from mouth, propulsive speech, and puffing of lips. Paralysis of the 7th, 9th, 10th, 11th, and 12th, and at times of other cranial nerves. Spastic paraplegia or hemiplegia of extremities. Sensory paralysis and ataxia. Respiratory difficulty, and in severe cases rapid, irregular pulse and Cheyne-Stokes' respiration.	Lesion or disorder of medulla (546).
435 Cheyne-Stokes' respiration	Long pauses in the respiration. After a pause the respiration commences slow and deep and rapidly becomes quick and superficial and as rapidly becomes slow and deep again and terminates in another long pause (lasting from five to sixty seconds, or more) and so on; each cycle being completed in a few minutes. A somewhat similar respiratory disturbance which is called Biot's respiration consists of frequent pauses in the respiratory act, lasting many seconds. Biot's respiration occurs in Bright's disease, etc., but has no particular significance in nervous diagnosis.	

Syndrome	Definition	Significance
436 Stokes-Adams' phenomenon	Slow pulse with long arrests (one half to one minute or more) during which the patient becomes pale, unconscious and may show a more or less pronounced convulsion.	Lesion of bundle of His in the heart.
437 Babinski and Nageotte's bulbar syndrome (1268)	Paralysis of the tongue diaphragm and larynx with ataxia of the homolateral side; analgesia and thermic anesthesia with motor paralysis of arm and leg of the contralateral side, myosis and pseudoptosis, dysphagia and dysarthria.	Lesion of medulla.
438 Ponto-cerebellar angle lesions (1363)	Homolateral deafness and contralateral analgesia and thermic anesthesia with preservation of tactile sensibility, nystagmus and weakness of conjugate deviation of the eyes towards the side of the lesion, anesthesia and abolition of reflexes in the distribution of the trigeminus on side of lesion, adiadocokinesia on the same side, optic neuritis, cerebellar ataxia and occipital pains, all more marked on side of lesion.	Lesion of ponto-cerebellar angle.
439 Millard-Gubler's syndrome (1269)	Homolateral facial paralysis with contralateral paralysis of arm and leg.	Lesions of pons.
440 Weber's syndrome (1270)	Homolateral oculo-motor paralysis with contralateral hemiplegia.	Lesion of crus cerebri.
441 Benedykt's syndrome (1270, 1325)	Homolateral oculo-motor paralysis associated with a tremor of the contralateral arm and leg.	Lesion of red nucleus or of rubro-spinal tract.
442 Brown-Séquard's paralysis or spinal hemiplegia (509, 838)	Below the point of lesion there are motor paralysis, exaggerated tendon reflexes, Babinski reflex, elevation of temperature, vaso-motor disturbances, and at times more or less hyperalgesia, ataxia, and loss of deep sensibility on the homolateral side, together with analgesia, thermic anesthesia, apallesthesia (353) and more or less tactile anesthesia, on the contralateral side. The anesthesia is bounded above by a narrow zone of hyperesthesia or hyperalgesia. Brown-Séquard's paralysis is more often atypical than typical.	Unilateral spinal lesion.
443 Spinal epilepsy (61 and 520)	Violent and continued tremor of the leg after it has been struck or shaken.	Greatly exaggerated tendon reflexes.
444 Bell's phenomenon	A turning upward of the eyeballs when an attempt is made to close the eyelids in peripheral facial paralysis.	Facial paralysis (peripheral).
445 Strümpell's tibialis phenomenon	When a patient, with spastic paralysis of a leg, lying on his back, attempts to flex the paralysed leg at the knee against light resistance, a dorsal flexion of the foot also occurs. Strümpell has found similar phenomena in the radial and pronator groups of muscles in the forearm.	Lesion of the pyramidal tract.
446 Babinski's associated movements of trunk and thigh	When a patient with spastic paralysis of one leg, lying on a hard surface without a pillow, with legs slightly abducted and hands folded across chest, attempts to raise the body to a sitting posture, the paralysed leg is involuntarily raised from its support while the normal leg lies at rest.	
447 Argyll-Robertson's pupillary reflex (891)	Loss of the pupillary reflex to light, while the reflex persists with efforts of accommodation and the consequent convergence and parallelism of eyeball (322).	Tabes, paresis and syphilis (661).
448 Romberg's symptom (static ataxia)	A wavering, staggering and even falling when attempting to stand still with eyes shut and with the feet in contact, either laterally or the one before the other (41).	
449 Biernacki's sign	A loss of the normal sensitiveness to pressure of the ulnar nerve behind the elbow.	Tetany (518).
450 Trousseau's sign	Pressure on the nerve trunks of the extremities causes a tetanic spasm of the muscles supplied by them.	
451 Chovstek's sign	The facial nerve shows extreme irritability to percussion or pressure.	
452 Erb's sign	Muscles and nerves are unusually excitable both to galvanism and to faradism.	

SYNDROMES AND SPECIAL SYMPTOMS OF DISEASE (Continued)
AND ANATOMICAL TERMS

Syndrome	Definition	Significance
453 Quinquand's sign	Patient spreads his fingers and presses their tips against the palm of the observer's hand which is held vertically. After a few seconds a series of slight shocks are felt as if the phalanges of each finger were knocking together.	Chronic alcoholism.
454 Erb's paralysis. Combined shoulder and arm paralysis (490)	A paralysis of the deltoid, biceps, brachialis anticus and supinators, long and short. In some cases the supra- and infraspinatus muscles are also paralysed. Paralysis of 5th and 6th nerve roots.	Lesion of the brachial plexus. Erb's paralysis. May be due to injury at birth (obstetric paralysis).
455 Klumpke's paralysis (490)	A paralysis of the small muscles of the hand and fingers. In some cases the muscles of the forearm, except the supinator longus, are also paralysed, and the eye on the same side exhibits myosis, retraction of the bulb and narrowing of the eyelid opening. Paralysis of 7th and 8th nerve roots.	
456 Brudzinski's neck sign	When the arms and legs are flexed fully on the trunk and the head is passively bent forward the patient shows signs of pain.	Meningitis.
457 Brudzinski's leg sign	When one leg is passively fully flexed on the trunk the other leg is drawn up by the patient into a similar position.	
458 Grasset and Gaussel's phenomenon	Inability of a patient when lying on his back to raise both legs simultaneously although he is able to raise either leg separately.	Organic hemiplegia (incomplete)

ANATOMICAL TERMS

460 Brain stem	Comprises the medulla oblongata, pons varolii and crura cerebri.
461 Central motor neurons (upper motor neurons)	Motor cerebral cortex, corona radiata, internal capsule, pyramidal tracts at base of brain, motor decussation and crossed and direct pyramidal tracts in spinal cord.
462 Peripheral motor neurons (lower motor neurons)	Motorial end plates, peripheral nerves, anterior nerve roots, nerve cells in the anterior horns of spinal cord and the motor nuclei in the brain stem.
463 Central sensory neurons (upper sensory neurons)	Sensory cerebral cortex, corona radiata, internal capsule, cerebellum and its peduncles, lemniscus and sensory decussation, nuclei of columns of Goll and Burdach, antero-lateral ascending (Gower's) tract, direct cerebellar (Flechsig's) tract and column of Clark.
464 Peripheral sensory neurons (lower sensory neurons)	Sensory end organs, peripheral nerves, posterior nerve roots, spinal ganglia, posterior horns and columns of Goll and Burdach in the spinal cord and nuclei of columns of Goll and Burdach.
465 Cilio-spinal center	Situated in the lateral horn of gray matter in the last cervical and first dorsal segment of the spinal cord and is connected with a higher center in the medulla. Destructive lesions of this center and its nerve roots cause (1st) a paralytic myosis, (2d) a narrowing of the eyelid opening, (3d) an enophthalmus; while irritative lesions (rare) of this center and its nerve roots cause (1st) a spasmodic mydriasis, (2nd) an exophthalmus.

PART II

DIFFERENTIAL DIAGNOSIS

A CLINICAL DIAGNOSTIC ANALYSIS OF THE SYMPTOMS

OBTAINED FROM THE EXAMINATION OF PATIENTS

Chart X—Motor Paralysis

DIAGNOSTIC ANALYSIS OF SYMPTOMS.

	Tests		
Symptoms Analyzed	Permanence of Paralysis	Reflexes in Paralyzed Muscles	
469 MOTOR PARALYSIS OR PARESIS After a careful examination has shown that the paralysis is a true one and is not simulated by any ankylosis or by pain on motion.	470 CONTINUOUS PARALYSIS	Abolition or diminution of both voluntary and reflex acts. 472 FLACCID PARALYSIS Lesions of peripheral motor neurons. There are hypotonia and changes in the electrical reaction of the nerves and muscles in very varying degree from simple diminution in excitability, to complete reaction of degeneration.	The differential diagnosis of those diseases in which FLACCID PARALYSIS occurs is set forth in CHART X a.
		Abolition or diminution of voluntary, with persistence or even exaggeration of reflex, acts. 473 SPASTIC PARALYSIS Lesions of central motor neurons. There are hypertonia and no alterations of electrical reaction of the nerves and muscles.	The differential diagnosis of those diseases in which SPASTIC PARALYSIS occurs is set forth in CHART X b.
		474 A combination of FLACCID PARALYSIS in the upper part of the paralyzed area, and of SPASTIC PARALYSIS in the lower part.	The differential diagnosis of those diseases in which there is a combination of FLACCID and of SPASTIC PARALYSIS, and of those in which INTERMITTENT PARALYSIS occurs is set forth in CHART X c.
	471 INTERMITTENT PARALYSIS.	All the muscles of the body and head. The muscles of one or both legs, rarely of arms. Commencing in legs, extending to arms Associated with a cervical rib.	

Chart Xa

Flaccid Paralysis

472 FLACCID PARALYSIS

- 475 No muscular atrophy, except rarely in chronic cases. Reflexes may be diminished only, not abolished.
  - Paralysis beginning in the feet and ascending to the head in adults.
    - The paralysis is in the form of a paraplegia, commencing in the fee
      ing bulbar symptoms (434), and causing death usually in the sec
      are pronounced the disease is probably a neuritis (488). The spl
      dry's paralysis and in addition hematoporphyrinuria.
  - No true paralysis but great hypotonia in infants.
    - Occurs usually congenitally, rarely during the first year of life. Nc
      in very abnormal positions. The child cannot use the slight po
      ances, no disturbances of organic reflexes. Electrical reaction muc
- 476 Marked muscular atrophy following the paralysis after the second week of the disease.
  Paralysis primary.
  The Degenerative Atrophies.
  - The organic reflexes are permanently disordered (1 and 267).
    - Marked sensory symptoms, such as pain, paresthesiae, anesthesia, etc., are present with the motor symptoms. The legs only are paralysed and exhibit trophic disturbances. There is incontinence of urine and the bladder is empty or nearly so.
      - Very acute onset. Sym
        thesia. May be blood
      - Acute, sub-acute or chr
      - Very chronic and progr
      - Very acute, acute or sul
        of the cord. Fibrillat
        preceded by hyperestl
  - The organic reflexes are normal or show only transitory disturbances (1 and 267).
    - Sensory symptoms, such as pain, nerve and muscle tenderness, paresthesiae, anesthesia, etc., are present.
      - Many spinal (very rarely cerebral) nerves are affected.
        - There is usually a histo
          acute, sub-acute and
          and arms (long neuro
          weakness, atrophy an
          duction of pain and l
          form of Korsakow's p
          form rarely runs an a
          ical form exhibits ma
      - The paralysis is coincident with the distribution of one, rarely of a few spinal nerves.
        - The motor and sensory paralysis (anesthesia) may be slight and the pain great.
    - No sensory symptoms, except rarely pain in early stage.
      - The paralysis is confined to the distribution of one or more cranial nerves.
        - Occurs most commonly
        - The paralysis is usually
      - The extensor muscles are alone affected.
        - Usually confined to the
          lead poisoning. Prev
      - A paralysis of acute onset, usually confined to the arms and legs, generally to a portion of one or both; in rare cases involves the cranial nerves.
        - The paralysis (which is
          sions. Rarely there
          so in children. The
          In infants and young
          neuritis with predom
          toms are common a
          of functionally relate
          The muscles of the
          and scurvy (Barlow's
          (4) encephalitic form
          of this disease with
      - A paralysis of chronic onset commencing in peronei muscles and extending symmetrically. Intrinsic muscles of the feet affected.
- 477 Muscular dystrophy preceding and causing the paralysis.
  Paralysis secondary.
  The Muscular Dystrophies.
  - A chronic disease commencing in childhood or youth and usually showing marked heredity. It exhibits a progressive muscular atrophy, usually combined with some hypertrophy, hence called muscular dystrophy. In time all the muscles become atrophied. The organic reflexes are normal and there are no sensory symptoms whatever and no motor paralysis, except such as would result from the muscular degeneration. Even the apparently hypertrophied muscles are weak. Tendon reflexes are early much diminished and finally absent in the affected muscles. There are no fibrillary contractions. The course of the disease is progressive, but very chronic, lasting many years. From its point of commencement the atrophy extends throughout the body. It produces a marked lordosis. Although the muscular dystrophies are divided into three groups, there are many transitional and mixed forms, and the examination of the excised muscles also shows mixed forms.
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DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS

ABSTRACT OF SYMPTOMS

DIAGNOSIS

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- 475 No muscular atrophy, except rarely in chronic cases. Reflexes may be diminished only, not abolished.
  - Paralysis beginning in the feet and ascending to the head in adults
    - The paralysis is in the form of a paraplegia, commencing in the feet and rapidly ascending the legs and body. Before the legs are completely paralysed the paralysis appears in the hands and rapidly ascends the arms. The ascending paralysis reaches the medulla and pons; producing bulbar symptoms (434), and causing death usually in the second week, though some rare cases may recover The organic reflexes are usually normal, except as affected by weakness of the abdominal muscles. There is little pain and little or no anesthesia. If sensory symptoms are pronounced the disease is probably a neuritis (488). The spleen is usually enlarged. There is rarely fever, and no electrical reaction of degeneration (353). Certain drugs, especially the prolonged use of trional or sulfonal, may cause symptoms closely resembling those of Landry's paralysis and in addition hematoporphyrinuria.
      - Acute Ascending (Landry's) Paralysis. 482
  - No true paralysis but great hypotonia in infants.
    - Occurs usually congenitally, rarely during the first year of life. No heredity. Muscles exhibit extreme want of tone and flabbiness. The legs are always, the arms are often, affected but in less degree. The mobility of the joints is greatly increased and the extremities can be placed in very abnormal positions. The child cannot use the slight power of voluntary muscular contraction still remaining to any advantage. The child can neither sit, stand, nor walk without assistance. Tendon reflexes absent, no muscular atrophy, no fibrillation, no sensory disturbances, no disturbances of organic reflexes. Electrical reaction much diminished, but no reaction of degeneration. The tendency of the disease is towards improvement, but not to complete recovery.
      - Myatonia Congenita. Amyotonia Congenita. 483
- 476 Marked muscular atrophy following the paralysis after the second week of the disease.

  Paralysis primary.

  The Degenerative Atrophies
  - The organic reflexes are permanently disordered (1 and 267).
    - Marked sensory symptoms, such as pain, paresthesiae, anesthesia, etc., are present with the motor symptoms The legs only are paralysed and exhibit trophic disturbances There is incontinence of urine and the bladder is empty or nearly so.
      - Very acute onset. Symptoms are most extensive in first few days and may improve later. May be deformity in lower dorsal region of the vertebral column. The anesthesia always present is not preceded by hyperesthesia. May be blood in cerebro-spinal fluid.
        - Lumbar enlargement of spinal cord. Injury of, or hemorrhage in, 484
      - Acute, sub-acute or chronic onset. Symptoms continue to extend for some time and are fairly symmetrical. Fibrillation may be present. The anesthesia usually present is not preceded by hyperesthesia.
        - Lumbar enlargement of spinal cord. Acute or chronic myelitis or myelomalacia of (791, 825). 485
      - Very chronic and progressive course. Symptoms at first mainly unilateral, becoming bilateral later. Cerebro-spinal fluid is usually under increased tension.
        - Lumbar enlargement of spinal cord. Tumor in, or compressing, (826). 486
      - Very acute, acute or sub-acute onset, usually sub-acute. Much pain in perineum and genitals. May be deformity in lumbar region of spine. Bed-sores are less common and symptoms less symmetrical than in lesions of the cord. Fibrillation common in the peronei muscles When the lesion is low down the muscles on anterior aspect of thigh are not paralysed and knee-jerks are normal. The anesthesia always present is often preceded by hyperesthesia
        - Lesions of the cauda-equina (1007, 1308). 487
  - The organic reflexes are normal or show only transitory disturbances (1 and 267)
    - Sensory symptoms, such as pain, nerve and muscle tenderness, paresthesiae, anesthesia, etc. are present.
      - Many spinal (very rarely cerebral) nerves are affected.
        - There is usually a history of poison (alcohol, etc.) or infection (diphtheria, etc.). The paralysis is usually in the form of a paraplegia and increases in intensity during the first few weeks, but in some cases reaches its height in a few days; acute, sub-acute and chronic forms. The extensors are usually weaker than the flexors and the consequent foot-drop causes, when walking is possible, a high stepping gait. The paralysis commences at the distal extremity of the legs and arms (long neurons) and extends towards and often involves those of the body. The cranial nerves are rarely affected and then especially the long ones (phrenic, pneumogastric, facial, etc). The most characteristic symptoms are weakness, atrophy and tenderness of the muscles affected, at first the small muscles of the hands and soles of the feet. In addition, there is usually pain, paresthesiae, mixture of hyperesthesia and anesthesia, ataxia, retardation of conduction of pain and loss of muscle sense Edema and trophic disturbances are common. The atrophy and emaciation are often extreme. Not infrequently there is fever, and in alcoholic cases there are mental disturbances usually in the form of Korsakow's psychosis (1100). No globulin or leucocytosis in cerebro-spinal fluid. Great variations in type occur. Some cases may be purely motor (lead palsy, etc), others mainly sensory and others mainly ataxic. This last form rarely runs an acute course: " acute ataxia " The diphtheritic form may involve the muscles of the extremities, but it always first appears in, and is usually limited to, the uvular and ciliary (accommodation) muscles. The arsenical form exhibits many severe sensory disturbances and a peculiar bronzing or pigmentation of the skin.
          - Multiple Neuritis. Polyneuritis. Pseudo-tabes. (662, 787, 823, 1008, 1147, 1307). 488
      - The paralysis is coincident with the distribution of one, rarely of a few spinal nerves
        - The motor and sensory paralysis (anesthesia) may be slight and the pain great.
          - Nerve is tender when it can be felt and is usually the seat of various paresthesiae and of intense pain In severe cases a complete, or partial, electrical reaction of degeneration and trophic disturbances are present.
            - Neuritis or injury of a spinal nerve (sciatica, etc.), (822, 941, 1146, 1173, 1303) 489
          - The motor and sensory symptoms coincide with the area of distribution of one or more nerves entering into the brachial plexus. Muscles of shoulder and upper arm, 5th and 6th cervical (Erb's paralysis); or muscles of hand and forearm with oculo-motor symptoms at times, 7th and 8th cervical nerves (Klumpke's paralysis).
            - Neuritis or injury or tumor of brachial plexus (Erb's or Klumpke's paralysis), (154-5). 490
          - One or more tender tumors can be felt on one or on many nerves, which are usually the seat of paresthesiae and of more or less pain, often severe
            - Single or multiple Neuromata, (938). 491
    - No sensory symptoms, except rarely pain in early stage.
      - The paralysis is confined to the distribution of one or more cranial nerves.
        - Occurs most commonly in injury, exposure to cold, extension of inflammation, syphilis and tumor at base of brain. The paralysis is not accompanied by symptoms of central disease. All the muscles supplied by the nerve are usually paralysed
          - Injury or inflammation of one or more motor cranial nerves (facial paralysis, etc.), (1303-7). 492
        - The paralysis is usually more widespread and accompanied by other symptoms of central disease. Only a portion of the muscles supplied by the nucleus may be paralysed. May be associated with atheromatous arteries or infection.
          - Inflammation, softening or hemorrhage involving one or more motor cranial nuclei (motor oculi paralysis, etc), (1304) 493
      - The extensor muscles are alone affected.
        - Usually confined to the extensors of the wrist and fingers causing wrist-drop. Supinator longus not involved (716) Rarely the muscles of dorsal flexion of foot are involved, causing foot-drop. Blue line on gums History of exposure to lead poisoning Previous attacks of lead colic, arthralgia, etc. Lead can be detected in the urine after the administration of iodide of potassium.
          - Lead Palsy, (788, 1050). 494
      - A paralysis of acute onset, usually confined to the arms and legs, generally to a portion of one or both; in rare cases involves the cranial nerves
        - The paralysis (which is always purely motor and never sensory, except temporarily in the legs in very rare cases) may rarely come on abruptly, but is usually preceded by fever and signs of meningeal irritation, exceptionally even convulsions. Rarely there is slight nerve and muscle tenderness Lymphocytosis and globulin in cerebro-spinal fluid in the acute stage. In a small percentage of cases the disease rapidly terminates fatally The onset is always acute, especially so in children. The paralysis is greatest during the first week or two and may improve rapidly at first and later more slowly, but recovery is usually only partial; some or many muscles remaining paralysed and atrophied throughout life In infants and young children the parts may remain more or less undeveloped. The vast majority of cases occur in the first three years of life, but the disease may occur in adults and then may, in rare cases, closely resemble multiple neuritis with predominating motor symptoms. Deformities, contractures, subluxation of joints from relaxed or contractured muscles and ligaments, and arrest of growth are common in young children Trophic and vaso-motor symptoms are common and the muscular atrophy is usually extreme The paralysed parts are usually cold and cyanotic, and the paralysed muscles exhibit the reaction of degeneration. The paralysis may have any distribution, but groups of functionally related muscles are always affected. The more widespread the paralysis, the greater will probably be the improvement The legs are more frequently affected than the arms and the extensors more than the flexors. The muscles of the trunk are often paralysed. Cranial nerves rarely affected (acute encephalitis) An infectious disease which may occur in epidemics, especially in warm weather. In young children the gums must be carefully examined and scurvy (Barlow's disease) must be carefully excluded. Poliomyelitis has been divided into a number of different forms which are partially described by their names (1) spinal form, (2) Landry's paralysis form, (3) brain-stem form, (4) encephalitic form, (5) acute cerebellar form, (6) neuritic form, in which form slight muscle tenderness may occur, (7) meningitic form, (8) abortive form. Chronic atrophic paralysis (547) may possibly be regarded as a chronic form of this disease with a very different etiology and pathology. Whether there is a true chronic anterior poliomyelitis is very doubtful. If it exists it is certainly very rare.
          - Acute Anterior Poliomyelitis. Myelitis of the Anterior Horns. Infantile Paralysis. Acute Atrophic Paralysis. Heine-Medin's Disease, (789, 1148, 1233). 495
      - A paralysis of chronic onset commencing in peronei muscles and extending symmetrically. Intrinsic muscles of the feet affected.
        - The disease usually commences before the age of twenty years and was formerly considered one of the muscular dystrophies as there is often a well marked heredity Usually the paralysis and atrophy do not extend much above the knees. In the later stages of some rare cases symptoms of atrophic paralysis have developed in the hands and arms The muscles obtained by harpooning show simple degenerative atrophy, and no apparent hypertrophy In rare cases there may be pain. Fibrillary contractions and reaction of degeneration are present. Club-foot is common. Leyden has described a form of hereditary muscular atrophy without hypertrophy, attacking the legs in the first ten years of life, in which the atrophy involves especially the muscles attached to the pelvis.
          - Spinal or Neuritic Muscular Atrophy. Peroneal type, and Charcot-Marie-Tooth's type, of muscular atrophy, (695) 496
- 477 Muscular dystrophy preceding and causing the paralysis.

  Paralysis secondary.

  The Muscular Dystrophies
  - A chronic disease commencing in childhood or youth and usually showing marked heredity It exhibits a progressive muscular atrophy, usually combined with some hypertrophy, hence called muscular dystrophy. In time all the muscles become atrophied. The organic reflexes are normal and there are no sensory symptoms whatever and no motor paralysis, except such as would result from the muscular degeneration. Even the apparently hypertrophied muscles are weak Tendon reflexes are early much diminished and finally absent in the affected muscles There are no fibrillary contractions. The course of the disease is progressive, but very chronic, lasting many years From its point of commencement the atrophy extends throughout the body It produces a marked lordosis. Although the muscular dystrophies are divided into three groups, there are many transitional and mixed forms, and the examination of the excised muscles also shows mixed forms.
    - The disease is most marked in the upper extremities Examination of excised muscles shows degeneration of fibers with a mixture of atrophy and hypertrophy in different fibers and in different parts of the same degenerated fiber. More or less interstitial fat is present.
      - The disease usually commences between the ages of 15 and 35 years. The atrophy begins in the orbicularis oris and extends to the other muscles of the face, to the shoulder girdle and finally to the legs. Patient cannot whistle, nor speak well, nor drink easily. Lips are thin and protrude: " tapir mouth " When smiling the mouth elongates only, its corners are not raised. Some muscles of shoulder are often apparently hypertrophied at first and later atrophied, or may be atrophied from the start
        - Facio-scapulo-humeral type, or Landouzy-Dejerine type, of dystrophy, (1151). 497 — 498 Simple Idiopathic Muscular Dystrophy
      - The disease usually commences between the ages of 12 and 15 years. The pectorals, trapezoid, deltoid, etc., are often hypertrophied at first and later atrophied. The biceps and especially the triceps are atrophied from the start. Motion of shoulder and arm much impaired. The face muscles are not involved until late in the disease, if at all
        - Scapulo-humeral type, or Erb's juvenile form, of dystrophy, (786, 1151). 499 — 498 Simple Idiopathic Muscular Dystrophy
    - The disease is most marked in lower extremities Examination of excised muscles shows degeneration of fibers with a mixture of atrophy and hypertrophy, and especially great quantities of interstitial fat.
      - The disease usually commences between the ages of 2 and 7 years, but sometimes much later. The calf muscles first show apparent hypertrophy, followed by the extensor cruris, infra-spinati, deltoid, etc Other muscles are atrophied. All muscles finally become atrophied. Even hypertrophied muscles are weak, but not so weak as those which are atrophied. Marked lordosis and weakness of serratus magnus muscle. In rising from the ground patient has to push himself up with his arms and crawl up upon himself. Waddling gait. Deformities and contractures occur in the later stages and the lordosis is later replaced by a marked kyphosis.
        - Pseudo-hypertrophic Paralysis, (1156). 500

Chart X b

Spastic Paralysis

473 SPASTIC PARALYSIS

- **478 Hemiplegia or Diplegia or Monoplegia (254–5)**
  - Congenital or acquired in infancy.
    - A motor paralysis of one (infantile hemiplegia) or both sides (Litt are common and may mask the exaggerated reflexes. In walkir and at times idiocy or insanity. Frequently there is a partial a of cerebral diplegia, bulbar symptoms (434) are present without expressions, etc., can occur involuntarily, but no voluntary motio
- **479 Hemiplegia, or Monoplegia (254, 258)**
  - Sudden onset, or stroke (ictus), usually with coma (205 and 1037), or with headache or vertigo and mental confusion. Not infrequently the attack commences with a hemiplegia which may or may not be followed by coma.
    - Symptoms of irritation (convulsions, rigidity, etc.) are more pronounced than are symptoms of paralysis.
      - The d
        achc
    - Symptoms of paralysis are more pronounced than those of irritation (convulsions may occur, especially in cortical lesions and in hemorrhage into the ventricles, in which case lumbar puncture yields a bloody fluid). The paralysis is in part temporary and in part permanent in varying degree. Slow improvement with almost perfect recovery in rare cases. More or less permanent mental impairment, often very slight. Usually patients are more emotional than previously. Exaggerated reflexes and ankle-clonus are present after coma has cleared up. Babinski is present from the start. Puffing, stertorous respiration is common. Cheyne-Stokes' respiration (375) and tracheal rales are very unfavorable symptoms.
      - A sud
        the
        ball
        arte
        face
        hem
      - Simila
        arte
        mon
      - Simila
        syph
        bas
  - Gradual onset without coma, except as a terminal symptom.
    - Sensory symptoms are always present. Organic reflexes are normal or only slightly disordered.
      - Brain symptoms. Steadily increasing psychic disorder, and local motor and sensory disturbances over the same area.
        - Heada
          mon
          mor
          men
          usu
          incr
          com
      - Spinal symptoms. Paralysis of motion and sensation on opposite sides of body.
        - Charac
          Syn
          spin
    - Choreic symptoms.
      - The paralysis is only slight and follows or a a paralysis (chorea mollis).
- **480 Paraplegia (257)**
  - There is paralysis of motion and sensation, usually in the form of paraplegia, more rarely in the form of a spinal hemiplegia (380), which later may become a paraplegia. The reflexes are exaggerated. Ankle-clonus and Babinski are present. Spasms and contractures and bed sores are often present. The organic reflexes are disordered. The motor paralysis is permanent or lasts a very long time. Sensory paralysis may be slight and transitory and may be altogether absent. The anesthesia is often limited above by a narrow zone of hyperesthesia.
    - Cranial and spinal nerves are involved.
      - Intention tremor, nystagmus, scanning speec
    - Arms and legs are paralysed. Priapism is common, also respiratory difficulty and early death. Radiating pains are common.
      - There may be a history of injury and a frac
      - No history of injury. Little or no pain.
      - May be history of remote injury. Much pain spinal fluid.
    - Legs only are paralysed. Girdle and radiating pains are common.
      - There may be a history of injury and a frac
      - No history of injury. Little or no pain.
      - May be a history of remote injury. Much gir
      - Evidence of Pott's disease or tumor compres there may be no sensory symptoms. Refl lymphocytosis.
      - History of working under increased atmosph
      - Old age, atheromatous arteries, loss of memo
      - Tumor can be seen or felt on back replacin is involved, or not. Club-foot is common
      - Signs of irritation predominate over those o unless the cord is also involved. Usually
    - Legs mainly involved. Arms involved later and slightly, if at all.
      - No ataxia.
        - Paralysis purely motor, a pare passive motion, especially w a multiple sclerosis (659). E
      - Ataxia.
        - There is a combination of mot In some cases, especially to
- **481 Paralysis of any extent: local, monoplegia, hemiplegia, or paraplegia**
  - Paralysis limited by some prominent anatomical landmark.
    - The motor paralysis is usually accompanied by a great variety o the physician (imaginary or delusional paralysis). A paralysed retention of urine is common. Hysterical symptoms (425). Im

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS					ABSTRACT OF SYMPTOMS				DIAGNOSIS	
473 SPASTIC PARALYSIS	478 Hemiplegia or Diplegia or Monoplegia (254–5)	Congenital or acquired in infancy.				A motor paralysis of one (infantile hemiplegia) or both sides (Little's disease) of the body, or of one extremity, without anesthesia and with very little muscular atrophy (from disuse). A squint is common The legs are often mainly or alone paralysed. Rigidity and contractures are common and may mask the exaggerated reflexes. In walking there is often adductor spasm, "scissors gait"(795-9). Extensor spasm is also frequent. Epileptiform convulsions are common, both at onset and during the course of the disease. There is much mental weakness and at times idiocy or insanity. Frequently there is a partial arrest of growth of the paralysed part. Athetosis and post-hemiplegic chorea and other motor disorders are common. Speech is commonly affected (dysarthria). The organic reflexes are not disordered In some cases of cerebral diplegia, bulbar symptoms (434) are present without fibrillation or atrophy, and automatic and mimetic actions are preserved. In such cases the eyeballs will follow a light or other object, but cannot be turned by any effort of the will, and laughing, weeping, emotional expressions, etc ,can occur involuntarily, but no voluntary motions.			Cerebral Palsy of Childhood Porencephaly. Acute encephalitis. Infantile hemiplegia or diplegia (Little's disease). (577, 630, 798, 1048.)	501
	479 Hemiplegia, or Monoplegia (254, 258)	Sudden onset, or stroke (ictus), usually with coma (205 and 1037), or with headache or vertigo and mental confusion Not infrequently the attack commences with a hemiplegia which may or may not be followed by coma.	Symptoms of irritation (convulsions, rigidity, etc.) are more pronounced than are symptoms of paralysis.			The disease is often the result of injury. When not so, prodromal symptoms (432) are usually present. Convulsions are common, both at the onset and during the course of the disease, which is often intermittent. Headache and mental impairment are frequent. The onset of paralysis is apoplectiform. It is usually motor only, is rather mild in degree and is usually transient. Organic reflexes normal.			Meningeal Apoplexy. Hemorrhage in cerebral meninges. Pachymeningitis Interna Hemorrhagica. Aneurism, etc (588, 1060.)	502
			Symptoms of paralysis are more pronounced than those of irritation (convulsions may occur, especially in cortical lesions and in hemorrhage into the ventricles, in which case lumbar puncture yields a bloody fluid). The paralysis is in part temporary and in part permanent in varying degree. Slow improvement with almost perfect recovery in rare cases More or less permanent mental impairment, often very slight. Usually patients are more emotional than previously. Exaggerated reflexes and ankle-clonus are present after coma has cleared up. Babinski is present from the start Puffing, stertorous respiration is common. Cheyne-Stokes' respiration (375) and tracheal rales are very unfavorable symptoms.			A sudden attack of paralysis usually of one-half of the body, usually of motion only, rarely of sensation only, sometimes of both. The lower branch of the facial nerve is much more completely and permanently paralysed than the upper, which may be normal. Onset is usually accompanied by profound coma (205) of several hours or days duration, but not always. In the coma there is often turning of the head, and conjugate deviation of eyeballs, away from the hemiplegic side. Pulse is slow. Slight variations of temperature about the normal point; when the variation is extreme the prognosis is bad. Prodromata are rather rare (432). There is often arterial disease and nephritis and usually high arterial tension. The disease usually occurs in advanced life. If death does not occur in the coma, there is usually more or less improvement in the paralysis; first in the face, then in the leg and lastly in arm. Contractures, causing flexion of joints of arm and extension of joints of leg, are frequent and of bad prognosis as regards recovery from the paralysis. Athetosis and other post-hemiplegic motor disturbances occur in rare cases.			Cerebral Hemorrhage.	503
									Cerebral Apoplexy. (432, 588, 832, 1043, 1061–3.)	504
						Similar to the above, but onset is more often instantaneous and coma is usually less profound and long and frequently is entirely absent. There are no prodromata. There is cardiac disease or other source for an embolus. The arterial tension is usually low. The disease usually occurs in youth or middle age. In general the symptoms are less severe and less permanent than in hemorrhage. Convulsions, aphasia and monoplegias are more common than in hemorrhage, because the lesion is more apt to be cortical.			Cerebral Embolism or acute softening	505
						Similar to the above, but onset may be more gradual, although still sudden and even at times instantaneous. Prodromata (432) are common. Coma is more frequently absent or less profound. There is often a history of syphilis. The arterial tension is usually high. Arterial disease is common. The disease usually occurs in advanced life. Bulbar symptoms are more common than in hemorrhage or embolism, because branches of the basilar artery are more frequently affected. Simultaneous paralysis of many cortical functions is more common than in hemorrhage.			Cerebral Thrombosis or acute softening	506
		Gradual onset without coma, except as a terminal symptom.	Sensory symptoms are always present. Organic reflexes are normal or only slightly disordered.	Brain symptoms. Steadily increasing psychic disorder, and local motor and sensory disturbances over the same area.	Headache, vertigo, vomiting and convulsions, general or local, are common. Choked disc or optic neuritis is usually present in tumor, much more rarely in abscess Steadily increasing inertia and more or less mental dullness. Focal symptoms, both spasmodic and paralytic, are usually present, especially Jacksonian epilepsy (431,605). Markedly increased tension of cerebro-spinal fluid and slow pulse in stage of compression, especially in tumor.	No fever. No infection, or origin for abscess. Chronic course. Steady progression of all symptoms. Often history of previous remote injury. No increase of cellular elements found in the blood or in cerebro-spinal fluid obtained by lumbar puncture Frequently symptoms irritative, rather than paralytic. Percussion of skull over region of tumor often shows tenderness. Headache is very rarely absent and is usually intense. It may be general or local, but is of little or no value in localizing the tumor.			Cerebral Tumor, including Cyst. (536–42, 578, 587, 833, 849, 855–61, 892, 908, 960, 1047.)	507
						Often fever. A source of infection. Rapid course, except that a latent period in the progress is common, followed by a rapid termination Delirium is common. Often a history of a recent injury. Leucocytosis may be found in the blood and in the cerebro-spinal fluid obtained by puncture (74). Frequently symptoms rather paralytic than irritative.			Cerebral Abscess or localised Meningitis. (578, 587, 907, 960, 1046.)	508
				Spinal symptoms. Paralysis of motion and sensation on opposite sides of body.		Characteristic symptoms are motor paralysis, loss of muscle sense and ataxia on one side of the body, with analgesia, thermic and tactile (?) anesthesia of other side (442) Stationary, or steadily progressive chronic course Symptoms becoming bilateral. Reflexes vary with the position of the tumor. They may be absent but are usually increased on the side of the motor paralysis, and are so greatly increased frequently as to cause spinal epilepsy (443).			Spinal Tumor or unilateral spinal lesion Brown-Séquard's paralysis. (442, 826, 836, 838, 975, 981, 1006.)	509
			Choreic symptoms.			The paralysis is only slight and follows or accompanies an attack of hemi-chorea, involving the same side of the body. Symptoms may be bilateral, but are then difficult of recognition. In many cases the hypotonia (almost invariably present) may simulate a paralysis (chorea mollis).			Choreic Paralysis. (622.)	510
			Cranial and spinal nerves are involved			Intention tremor, nystagmus, scanning speech, ataxia, irregularly distributed motor and sensory paralysis.			Disseminated Sclerosis. (580, 659, 668, 688, 755, 765, 799, 913, 1051.)	511
	480 Paraplegia (257)	There is paralysis of motion and sensation, usually in the form of paraplegia, more rarely in the form of a spinal hemiplegia (380), which later may become a paraplegia The reflexes are exaggerated Ankle-clonus and Babinski are present. Spasms and contractures and bed sores are often present The organic reflexes are disordered The motor paralysis is permanent or lasts a very long time Sensory paralysis may be slight and transitory and may be altogether absent The anesthesia is often limited above by a narrow zone of hyperesthesia.	Arms and legs are paralysed. Priapism is common, also respiratory difficulty and early death. Radiating pains are common.			There may be a history of injury and a fracture of vertebrae with deformity. The knee-jerks may be abolished in the early stages, later increased. There may be blood in the cerebro-spinal fluid.	Very acute onset	Cervical region of spinal cord above cervical enlargement.	Injury or hemorrhage in,	512
						No history of injury. Little or no pain.	Acute onset		Acute myelitis or myelomalacia of, (828.)	513
							Chronic onset		Chronic myelitis or myelomalacia of,	514
						May be history of remote injury. Much pain radiating into arms. Much pain and rigidity and spasm of back Symptoms at first more unilateral. Local pains. May be increased tension of cerebro-spinal fluid.	Very chronic onset		Tumor in,	515
			Legs only are paralysed. Girdle and radiating pains are common			There may be a history of injury and a fracture of vertebrae with deformity. The knee-jerks may be abolished in the early stages, later increased. There may be blood in the cerebro-spinal fluid	Very acute onset	Dorsal region of spinal cord.	Injury or hemorrhage in,	516
						No history of injury. Little or no pain.	Acute onset		Acute myelitis or myelomalacia of, (795, 829.)	517
							Chronic onset		Chronic myelitis or myelomalacia of,	518
						May be a history of remote injury Much girdle pain. Rigidity and spasm in back. Symptoms at first unilateral. Local pain. The tension of the cerebro-spinal fluid may be increased.	Very chronic onset		Tumor in,	519
						Evidence of Pott's disease or tumor compressing the cord. Rigidity and spasms in muscles of legs and back are frequent. Usually intense pain when spine is bent or moved. Much girdle pain and radiating pain. In cases of compression due to Pott's disease there may be no sensory symptoms. Reflexes may be so exaggerated as to constitute spinal epilepsy (81, 443), but vary according to seat of lesion. Contractures may occur. Cerebro-spinal fluid is under increased tension and may contain globulin and lymphocytosis			Compression Myelitis. (795.)	520
						History of working under increased atmospheric pressure. Headache, vertigo and vomiting in early stage of disease.			Caisson disease or Diver's paralysis.	521
						Old age, atheromatous arteries, loss of memory Paralysis is not severe, resembles that of paralysis agitans without tremor, and reflexes of all kinds are not much altered.			Senile Paraplegia.	522
						Tumor can be seen or felt on back replacing the spines of the vertebrae, or the cleft can be felt in spine without any visible tumor (occulta). There may or may not be paralysis Reflexes may be present or exaggerated according as the lumbar enlargement is involved, or not. Club-foot is common.			Spina-bifida.	523
						Signs of irritation predominate over those of paralysis Much rigidity, girdle and radiating pains and spasm in back muscles. There is usually spasmodic retention of the urine in early stages Paralysis is of sudden onset, slight in degree and disappears soon, unless the cord is also involved. Usually a history of injury Reflexes exaggerated. Lumbar puncture may yield a bloody fluid. Symptoms vary with position of hemorrhage.			Hemorrhage in spinal membranes Hematorrhachis. (973.)	524
			Legs mainly involved. Arms involved later and slightly, if at all.	No ataxia.		Paralysis purely motor, a paresis rather than a complete paralysis, very slowly progressive and often stationary during long periods. Spasm, rigidity of leg muscles and later contractures. Greatly exaggerated reflexes Legs offer great resistance to passive motion, especially when rapid. Ankle-clonus, Babinski and spinal epilepsy (143). Organic reflexes little if at all disordered. Arms usually not affected, but may be slightly so after years. This clinical picture is at times the early stage of a multiple sclerosis (659) Erb's syphilitic spinal paralysis, although in it the reflexes are not always greatly exaggerated and the posterior columns are at times involved, cannot be distinctly separated from this disease, except perhaps by its etiology.			Spastic Paraplegia or lateral sclerosis (usually symptomatic and part of a more extensive lesion, spinal or cerebral.) (797).	525
				Ataxia.		There is a combination of motor paralysis and marked ataxia which develop very gradually and slowly Some moderate pain and rarely there may be anesthesia and analgesia. The tendon reflexes are exaggerated. Ankle-clonus and Babinski. In some cases, especially toward the end of the disease the reflexes may be abolished, but the Babinski persists. It is a disease of adult life, but is analogous to Friedreich's ataxia (652).			Ataxic Paraplegia or postero-lateral sclerosis (660 796.)	526
	481 Paralysis of any extent: local, monoplegia, hemiplegia, or paraplegia	Paralysis limited by some prominent anatomical landmark				The motor paralysis is usually accompanied by a great variety of sensory symptoms. The disease is usually of sudden onset and often follows some powerful emotion It is usually permanent until cured by another strong emotion, which may be often artificially produced by the physician (imaginary or delusional paralysis). A paralysed limb often offers great resistance to passive motion, even to slow motion Contractures are common. Knee-jerks are usually increased, but no true ankle-clonus or Babinski Organic reflexes rarely disturbed, but retention of urine is common. Hysterical symptoms (425) Impossibility of explaining all of the symptoms by any one organic lesion. The paralysis is not limited to one muscle, or to the distribution of one nerve.			Hysterical Paralysis. (747–8, 758, 793, 878, 1074.)	527

Chart Xc

Combined and Intermittent Paralysis

474 COMBINED PARALYSIS

- Cranial and spinal nerves involved.
  - Sensory symptoms present.
    - Bilateral symptoms.
      If the patient does not promptly die, one or mo
      gia (526). There is usually dysarthria, dyspl
      unilateral.
    - Crossed paralysis (256).
      - Paralysis of one or more eye muscles of one side
      - Paralysis of facial (both branches) or trigeminal
      - Paralysis of hypoglossus of one side and of ar
  - No sensory symptoms
    - Acute.
      The onset of paralysis is sudden. If the patient
      sive. They are usually unilateral, but may be
      paralysed, while there is a spastic paralysis n
      May be due to acute inflammation, hemorrh
      myelitis.
    - Chronic—The chronic forms of these diseases, with the spinal form (547), constitute the progressive muscular atrophies and resemble the muscular dystrophies in that the paralysis and atrophy advance together slowly, and it is difficult to say which is primary. They also constitute a group of chronic degenerative atrophies.
      - The paralysis involves the eye muscles.
        A g
      - The paralysis involves the lips, tongue, pharynx and larynx.
        Th
        n
        A
        th
        n
- Spinal nerves alone involved
  - No sensory symptoms.
    - Symmetrical paralysis commencing in the small muscles of hands or in shoulder girdle muscles.
      The muscles affected show progressive weakness
      or more rarely, in the muscles of the should
      thumb cannot be brought across hand to t
      but not always. There are secondary contract
      of muscles is increased. Often associated w
      umns are involved or not. If is difficult to dr
  - Marked sensory symptoms are present, such as pain, paresthesiae, anesthesia, etc., with the motor paralysis.
    - Both arms and legs are paralysed. There are trophic disturbances in the arms and not the legs. Pupils are often unequal. Reflexes are abolished in the arms and increased in the legs. Babinski and ankle-clonus are present. The bladder is usually more or less distended; its detrusor being paralysed.
      - Very acute onset. Sympt
        may yield a bloody fl
      - Acute, sub-acute or chron
      - Chronic course, intense pa
        common. Cerebro-spina
      - Very chronic onset and a
  - Dissociation of sensation (363) is present.
    Dissociation of sensation is the most characteristic symptom and is con
    Trophic lesions are usually prominent. Pemphigus, ulceration and r
    trophic symptoms predominate over motor symptoms in the arms;
    present the symptoms may be both in arms and legs, and the mo
    extending at times over decades, but slowly progresses and the a

471 INTERMITTENT PARALYSIS

- All the muscles of the body and head.
  The characteristic sign of the disease is the rapid tiring of the muscles when in activity. I
  the myasthenic reaction (401). There is no muscular atrophy and no reaction of degener
  spinal nerves may be affected. The head is usually held retracted on account of the pt
- Muscles of one or both legs, rarely of arms.
  Intermittent attacks of painful muscle cramp, and weakness of leg or legs, caused by walk
  and by the X-ray. Rarely the disease occurs in one or both arms. No sensory disturbances
  of this disease.
- Commencing in legs extending to arms.
  Recurrent attacks of paralysis of the muscles of the legs usually first and then of arms, lastin
  heard. The cranial nerves are not attacked. There is usually well marked heredity, or th
  mechanical excitability of the muscles, but in some groups of family periodic paralysis the
- Associated with a cervical rib
  A cervical rib can be felt and can be seen with the X-ray. In some cases of cervical rib, atta
  tion, redness of the skin which comes on after the arm has been used a short time, and, if v

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS					ABSTRACT OF SYMPTOMS			DIAGNOSIS	
474 COMBINED PARALYSIS	Cranial and spinal nerves involved.	Sensory symptoms present.	Bilateral symptoms		If the patient does not promptly die, one or more cranial nerves are paralysed. There is more or less marked spastic paraplegia (526). There is usually dysarthria, dysphagia, ataxia, anesthesia and often vertigo. Symptoms at first may be more unilateral.	Acute onset. Regressive course. No optic neuritis. A variety of apoplexy (504).		Hemorrhage, softening or acute inflammation in brain-stem (656).	535
						Chronic onset. Progressive course. Optic neuritis.		Tumor in, or compressing the brain-stem (656).	536
			Crossed paralysis (256)		Paralysis of one or more eye muscles of one side and of arm and leg of opposite side.	Acute onset and regressive course. No optic neuritis. No increased tension of cerebro-spinal fluid.		Hemorrhage or softening in crus cerebri.	537
						Chronic onset and progressive course and optic neuritis. May be increased tension of cerebro-spinal fluid.		Tumor in, or compressing crus cerebri	538
					Paralysis of facial (both branches) or trigeminal nerve on one side and of arm and leg of opposite side.	Acute onset and regressive course. No optic neuritis. No increased tension of cerebro-spinal fluid.		Hemorrhage or softening in pons.	539
						Chronic onset and progressive course and optic neuritis. May be increased tension of cerebro-spinal fluid.		Tumor in, or compressing pons.	540
					Paralysis of hypoglossus of one side and of arm and leg of opposite side.	Acute onset and regressive course. No optic neuritis. No increased tension of cerebro-spinal fluid.		Hemorrhage or softening in medulla	541
						Chronic onset and progressive course and optic neuritis. May be increased tension of cerebro-spinal fluid.		Tumor in, or compressing medulla	542
		No sensory symptoms	Acute		The onset of paralysis is sudden. If the patient does not die promptly, later the symptoms are regressive rather than progressive. They are usually unilateral, but may be bilateral. A number of cranial nerves, either motor or sensory, or both, are paralysed, while there is a spastic paralysis more or less pronounced in the arms and legs. Vertigo is a common symptom. May be due to acute inflammation, hemorrhage, thrombosis, embolism, or compression. May occur in acute anterior poliomyelitis	There is more or less extensive paralysis of the motor nerves of eyeball (3rd, 4th and 6th); so that ptosis, squint, double vision, nystagmus, etc., may result.		Acute or Apoplectiform Polioencephalitis Superior (1064).	543
						There is paralysis of the lips, tongue, pharynx and larynx (7th, 9th, 10th, 11th and 12th nerves), with consequent dysarthria and dysphagia and usually ataxia and respiratory disturbances.		Acute or Apoplectiform Polioencephalitis Inferior, Acute Bulbar paralysis.	544
			Chronic—The chronic forms of these diseases, with the spinal form (547), constitute the progressive muscular atrophies and resemble the muscular dystrophies in that the paralysis and atrophy advance together slowly, and it is difficult to say which is primary. They also constitute a group of chronic degenerative atrophies	The paralysis involves the eye muscles	A gradual onset of weakness of ocular muscles. It may be steadily progressive or, having progressed to a certain point, it may remain stationary. Muscles may be attacked in any order, ptosis, squint, immobile eyeballs, immobile pupils. The disease may attack only the external muscles of the eyeball (ophthalmoplegia externa), or only the internal muscles (ophthalmoplegia interna), or both, (ophthalmoplegia completa). Disease may be complicated by bulbar paralysis (546) and is usually associated with amyotrophic lateral sclerosis.			Progressive Ophthalmoplegia. Polioencephalitis Superior Chronica often symptomatic of a steadily progressive, more widespread disease such as tabes, tumor, etc.).	545
				The paralysis involves the lips, tongue, pharynx and larynx.	The head is bent forward. There are bulbar symptoms (434). There are drooling of saliva, dysarthria, dysphagia, and aphonia. Paralysis, tremor, atrophy, fibrillary contraction of muscle of tongue, lips, uvula, pharynx, larynx, etc. Both facial nerves are involved in some cases. The paralysis very slowly progresses. There are symptoms of a mild spastic paraplegia in legs with ankle-clonus and Babinski. A disease of advanced life. Often associated with amyotrophic lateral sclerosis and at times with progressive ophthalmoplegia (545). In addition to the pseudo-bulbar paralysis of myasthenia gravis (553) there is another form due to lesions in both cerebral hemispheres in which there is no muscle atrophy, or fibrillation, and no change in the electrical reaction, but all the other symptoms of bulbar paralysis more or less marked. There is more mental impairment and greater emotional excitability than in true bulbar paralysis.			Progressive Bulbar Paralysis. Polioencephalitis Inferior Chronica. Labio-glosso-pharyngeal Paralysis, (694, 1150).	546
	Spinal nerves alone involved	No sensory symptoms.	Symmetrical paralysis commencing in the small muscles of hands or in shoulder girdle muscles		The muscles affected show progressive weakness, atrophy, fibrillary contractions and all degrees of alteration in electrical excitability from simple diminution to complete reaction of degeneration. The process commences in the small muscles of the hands, or more rarely, in the muscles of the shoulder girdle (scapulo-humeral type), is usually fairly symmetrical and extends to the other groups of muscles in arms, body and even legs. The muscular weakness follows and is dependent upon the atrophy. The thumb cannot be brought across hand to touch the little finger. The fingers cannot be spread apart, nor can their last two phalanges be extended on the first. The legs show a mild degree of spastic paraplegia, with ankle-clonus and often Babinski, but not always. There are secondary contractures, especially the "claw hand." The head is usually bent forward and there is much deformity about shoulder and other parts. A disease of adult life, and of very chronic course. Mechanical irritability of muscles is increased. Often associated with progressive bulbar paralysis (546). Some authors divide this symptom complex into two groups according as to whether the atrophy or the paralysis is primary, and as to whether the lateral columns are involved or not. It is difficult to draw any such distinction clinically. The one form may be an earlier stage of the other.			Amyotrophic Lateral Sclerosis. Progressive Spinal Muscular Atrophy. Aran-Duchenne type of muscular atrophy. Chronic Atrophic Paralysis, (695, 797, 1149).	547
		Marked sensory symptoms are present, such as pain, paresthesiae, anesthesia, etc., with the motor paralysis.	Both arms and legs are paralysed. There are trophic disturbances in the arms and not the legs. Pupils are often unequal. Reflexes are abolished in the arms and increased in the legs. Babinski and ankle-clonus are present. The bladder is usually more or less distended; its detrusor being paralysed.		Very acute onset. Symptoms are most extensive in first few days and may slowly improve later. May be deformity in cervical region of spine. Knee-jerks may be absent in early stages. Lumbar puncture may yield a bloody fluid.		Cervical enlargement of spinal cord	Injury of, or hemorrhage in,	548
					Acute, sub-acute or chronic onset. Symptoms continue to extend for some time and are fairly symmetrical. Organic reflexes disordered.			Acute or chronic myelitis or myelomalacia of, (795, 835).	549
					Chronic course, intense pain and spasms in arms and neck precede the paralysis and contractures and muscular atrophy in hands, "claw hand." Cutaneous eruptions (herpes, pemphigus, etc.) are not uncommon. Cerebro-spinal fluid may be under increased tension and may show lymphocytosis.			Pachymeningitis hypertrophica cervicalis.	550
					Very chronic onset and a progressive course. Symptoms at first mainly unilateral, becoming bilateral later. Cerebro-spinal fluid may show increased tension.			Tumor in, or compressing, (836)	551
		Dissociation of sensation (363) is present.			Dissociation of sensation is the most characteristic symptom and is combined with pain and paresthesiae and more or less motor paralysis and atrophy. The muscular atrophy has often the location and characteristics of that of progressive spinal muscular atrophy (547). Trophic lesions are usually prominent. Pemphigus, ulceration and mutilation of the hands and trophic lesions of bones, muscles, and other tissues occur in the type called Morvan's disease. In the most common form the cervical region is alone affected and sensory and trophic symptoms predominate over motor symptoms in the arms; while the legs show a mild spastic paraplegia (525), and scoliosis or kyphosis occur in more than half the cases. Paradoxical (379) and spontaneous sensations have been noted. When a diffuse glioma is present the symptoms may be both in arms and legs, and the motor symptoms are about as prominent as the sensory. All forms of reflex action are abolished in the parts in which dissociation of sensation is present. The cervical form of the disease runs a chronic course, extending at times over decades, but slowly progresses and the anesthesia at first slight steadily becomes more marked. The diffuse form often runs a fairly rapid course			Syringomyelia. Central gliosis. Morvan's Disease, (693, 847, 1089, 1170, 1187)	552
471 INTERMITTENT PARALYSIS	All the muscles of the body and head.				The characteristic sign of the disease is the rapid tiring of the muscles when in activity. Patient can walk well at the start, but after a few (or a few hundred) steps is tired out. The same is true of all other voluntary acts. Examination of the muscles with electricity gives the myasthenic reaction (401). There is no muscular atrophy and no reaction of degeneration. In the domain of cranial nerves (in which the case usually commences) there may be ptosis, diplopia, ophthalmoplegia, diplegia facialis, dysarthria, dysmasesia, etc., and all the spinal nerves may be affected. The head is usually held retracted on account of the ptosis. The symptoms are slight in the morning and grow worse during the day. No sensory disturbances except painful cramps. Organic reflexes normal.			Myasthenia gravis. Pseudo-bulbar Paralysis	553
	Muscles of one or both legs, rarely of arms.				Intermittent attacks of painful muscle cramp, and weakness of leg or legs, caused by walking. During the attack the feet are cold, and there is diminished or absent pulsation in arteries of feet, associated with marked arterio-sclerosis of arteries of leg as shown by palpation and by the X-ray. Rarely the disease occurs in one or both arms. No sensory disturbances except painful cramps. Organic reflexes normal. Angio-spastic hemiplegia in which temporary attacks of hemiplegia, sometimes associated with aphasia, occur, is probably a variety of this disease.			Intermittent Limping or Claudication. Dysbasia Angio-sclerotica, (1190).	554
	Commencing in legs extending to arms.				Recurrent attacks of paralysis of the muscles of the legs usually first and then of arms, lasting a few hours or days. The attacks usually occur in the morning or after rest. During the attack the left cardiac ventricle may become temporarily dilated and a murmur may be heard. The cranial nerves are not attacked. There is usually well marked heredity, or the disease occurs in family groups. During a severe attack there is often a diminution or absence of the reflexes and of the faradic and galvanic excitability of the nerves, and of the mechanical excitability of the muscles, but in some groups of family periodic paralysis these negative symptoms are not present. Some of these cases are apparently due to malaria and can be cured by the administration of quinine.			Family Periodic Paralysis.	555
	Associated with a cervical rib				A cervical rib can be felt and can be seen with the X-ray. In some cases of cervical rib, attacks occur, but only after use of the arm. These attacks are usually unilateral, even though the extra rib is on both sides. The attack consists of numbness, tingling, feeling of congestion, redness of the skin which comes on after the arm has been used a short time, and, if use of the arm is continued, the arm shows a decided paresis, which passes off if the arm is kept at rest. An ununited fracture of the clavicle will rarely cause similar symptoms.			Pressure of cervical rib upon sub-clavian artery.	556

Chart XI
Convulsion or Spasm

DIAGNOSTIC ANALYSIS OF SYMPTOMS

Symptom Analyzed	Tests		
	Character	Extent	
570 CONVULSION OR SPASM (242)	571 CLONIC mainly (246)	GENERAL CONVULSION	Diseases in which convulsions occur are set forth in Chart XI a.
		LOCAL CLONIC SPASM	Diseases in which local clonic and all forms of tonic spasms occur are set forth in Chart XI b.
	572 TONIC mainly (245)	GENERAL TONIC SPASM	
		LOCAL TONIC SPASM	
	573 CHOREIFORM (272)	Diseases in which choreiform and athetoid spasms occur are set forth in Chart XI c.	
	574 ATHETOID (271)		

Chart XI a

General Clonic Convulsion

571 GENERAL CLONIC CONVULSION

- Apyrexia.
  - The convulsion commences in all the muscles at about the same time (epileptiform convulsion).
    - Loss of consciousness, (coma or semi-coma) (205). Frequently biting of the tongue or other injury. Short duration.
      - No other symptom of disease except the convulsion.
        - Repeated attacks.
        - One attack or one series of attacks.
      - Symptoms of serious brain disease.
        - Congenital or in infancy.
        - In youth or more often in adults.
      - Symptoms of cerebro-spinal disease.
      - Symptoms of disease of other organs than the brain
        - Kidney disease.
        - Cardiac disease.
        - Blood disease.
      - Symptoms of poisoning.
        - Blue line on gums, lead i
        - Alcoholic odor of breath
    - Apparent, but no true coma (shown by susceptibility to suggestion). No biting of tongue or other injury. Long duration.
      - Symptoms of hysteria (425).
  - The convulsion always commences in one group of muscles and later extends over the whole or part of one side of the body and often over both sides. Jacksonian epilepsy (431).
    - If the convulsion remains unilateral, consciousness may or may not be lost, but it is always lost when the convulsion becomes bilateral.
- Hyperpyrexia.
  - Epileptiform convulsion.
    - Coma during and after the convulsion.
- Pyrexia.
  - Epileptiform con- convulsion. Coma during and usually after the convulsion.
    - Headache, backache and radiating pains, delirium, vertigo and vomiting, especially on change of posture, hyperalgesia (spinal and elsewhere), photophobia, etc., are early symptoms. Retraction of head, opisthotonus, etc. (265). Paralysis of cranial nerves (squint, etc.), cutaneous eruptions (herpes), tâches cérébrales and Kernig's symptom (319). Tonic spasm and paralysis are more common in basic inflammations, and clonic spasm in cortical inflammations.
      - Lumbar puncture gives a bloody or purulent fluic pressure containing glc polymorphonuclear leu
      - Lumbar puncture gives a increased tension and ulin and many mono cytes, and if the di polymorphonuclear leu
      - Lumbar puncture gives a increased tension, but cellular elements.
  - Coma during the convulsion.
    - May occur in children at the onset of any infectious disease, especia
    - Is the result of some unusual metabolic changes within the body, ar

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS						ABSTRACT OF SYMPTOMS	DIAGNOSIS		
571 GENERAL CLONIC CONVULSION	Apyrexia.	The convulsion commences in all the muscles at about the same time (epileptiform convulsion).	Loss of consciousness, (coma or semi-coma) (205). Frequently biting of the tongue or other injury. Short duration.	No other symptom of disease except the convulsion.	Repeated attacks.	The convulsion, or the major attack (le grand mal), is at first tonic with arrest of respiration. The face, at first pale, soon becomes flushed and cyanotic. The pupil is dilated and inactive. This tonic state is quickly followed (¼ to ½ minute) by clonic spasm of longer duration (½ to 5 minutes) with noisy respiration, and froth on lips often bloody from the tongue, which is often bitten during the attack. There is often lateral deviation of the head and eyeballs and nystagmus. At times urine and feces are passed during the attack. The attack is often preceded by twitching of certain muscles, "motor aura," or by a sensory hallucination (tactile, auditory, visual, olfactory, etc.) called the "sensory aura" (430) and is often ushered in by a cry, "the epileptic cry." In some attacks the temperature of the body is raised and albuminuria is frequent. The tendon reflexes are occasionally absent during and immediately after the attack. A deep sleep and some muscular and sensory weakness (stage of exhaustion) often follow the attack. After a violent attack purpuric spots are occasionally seen on the forehead and face. Complete amnesia in regard to it always follow an attack. There are recurrences at varying intervals, but attacks can neither be brought on nor arrested by pressure upon any part of the body. In some cases the attacks occur only at night or while asleep by day (nocturnal epilepsy). The attacks vary greatly in character. At times there is merely rigidity without clonic spasm (epilepsia media). At times there is merely loss of consciousness without action or with some automatic act: the minor attack (le petit mal). At times the patient is unconscious and runs forwards and turns around and around (epilepsia procursiva rotatoria) or performs a series of very complicated acts (automatism). At times the patient is unconscious and performs an act of violence (epileptic mania). At times an attack of insanity follows or replaces a convulsive attack (psychic equivalent). In old cases of epilepsy there is more or less mental impairment (epileptic dementia). Such patients are often destructive and apparently vicious. Malingerers have been known to imitate an epileptic convulsion closely. The diagnosis of malingering can only be made by long observation, by the purposeful and timely nature of the attack and by the confession of the malingerer.	Idiopathic Epilepsy (including the major attack, the minor attack, epilepsia media, nocturnal epilepsy, epileptic automatism, epileptic mania, psychic equivalent, epileptic dementia), (430, 1027, 1058, 1071).		575
					One attack or one series of attacks.	A convulsive attack, especially common in rachitic children, but occurring also in adults, especially in pregnancy, altogether similar (epileptiform) to the above, but occurring only once, or in one series, and not repeated. Associated often with digestive disturbances and abdominal distension and may be due to poisoning (ptomaine, alcohol, etc.), or to the status lymphaticus. May be due in some children to peripheral irritation. No sharp line can be drawn between these convulsions and those of uremia (581), or lead (584), or alcohol (585), or auto-intoxication (596).	Eclampsia, (1059).		576
				Symptoms of serious brain disease.	Congenital or in infancy.	The disease is congenital or occurs in early infancy. Unilateral or bilateral convulsions occur, associated with hemiplegia or diplegia, with considerable mental impairment. There is usually dysarthria, rarely aphasia, often post-hemiplegic motor disturbances: athetosis, rigidity and contractures. Frequently there is more or less complete arrest of development, physical and mental.	Cerebral Palsy of Childhood. Porencephaly. (501, 1048).		577
					In youth or more often in adults.	Between the convulsive attacks, which are followed by a temporary weakness of the muscles involved, there are symptoms of a steadily progressing brain disease with usually motor, sensory and psychic symptoms, and a steady advance towards coma or dementia. Headache, vertigo and vomiting. Choked disc or optic neuritis. More or less motor and sensory paralysis. Mental inertia (apathy) and increasing mental weakness and loss of memory. Localizing symptoms are sometimes present. Convulsions are often local.	Cerebral Tumor (including abscess and cyst) not in or near motor area of cortex (507-8).		578
						Loss of will power, restlessness, delusions (usually of exaltation) and symptoms of insanity. Poor judgment. Good natured but irascible. Childish. Characteristic blurred speech. Tremor of lower facial muscles, lips, tongue and hands, and awkwardness (ataxia and apraxia). Unequal and irregular pupils, Argyll-Robertson's pupil, optic neuritis or atrophy. History of syphilis. Lumbar puncture shows lymphocytosis in cerebro-spinal fluid and syphilitic reaction of Noguchi (419).	Paresis. General Paresis. Paralytic Dementia, (675, 763, 895, 1049, 1104, 1215, 1230).		579
				Symptoms of cerebro-spinal disease.		Intention tremor, scanning speech, nystagmus, unsteady gait, motor and sensory paralyses, many symptoms of local lesion, etc.	Disseminated Sclerosis, (511, 659, 668, 688, 755, 765, 799, 913, 1051).		580
				Symptoms of disease of other organs than the brain	Kidney disease.	There are usually a series of convulsions, accelerated respiration, restlessness, cyanosis and contracted pupils. Often edema of lungs and of other tissues. The arterial tension is usually high, the heart hypertrophied, and the urine contains albumen and many casts and is usually scanty. There may be albuminuric retinitis, headache, vomiting, Cheyne-Stokes respiration and somnolence.	Uremic convulsion, (576).		581
					Cardiac disease.	Slow pulse. Long intermission in heart beats associated with coma and convulsions, which pass off after the heart begins beating again. Arteries atheromatous. Advanced life usually.	Stokes-Adams' Disease, (436, 907, 1057).		582
					Blood disease.	Rapid feeble pulse of small volume. Insufficient amount of blood or of red cells and hemoglobin. Pallor, dyspnoea on exertion and strabismus are common. Often severe digestive disorders with congested portal circulation are present.	Anemic convulsion.		583
				Symptoms of poisoning.		Blue line on gums, lead in urine after taking K.I. Wrist-drop. History of lead colic and of exposure to lead.	Lead convulsion (194, 576, 1050).		584
						Alcoholic odor of breath and general tremor and nervousness. Muscular tenderness. History of alcoholic abuse.	Alcoholic convulsion, (576).		585
			Apparent, but no true coma (shown by susceptibility to suggestion). No biting of tongue or other injury. Long duration.	Symptoms of hysteria (425).		The attack is always in the presence of an audience. There is always a warning in the form of globus hystericus, palpitation, etc. Patient may fall or glide to the ground but does not hurt herself. The convulsion is very irregular and violent and many of the movements seem purposeful and to be theatrical posing (crucifixion, etc.) and assumed attitudes, (attitudes passionelles). Patients often "rave" during the attack, which usually lasts a long time, especially if the audience be excited. Eyes are usually closed and the eyeballs turn upwards if eyelids are forced open. Attack can usually be arrested by pressure on ovarian region, supra-orbital nerves, etc., especially if the audience be sent from the room. Moderate pressure upon these parts may cause an attack. Great variety of sensory symptoms. Anesthesia is usually present. Hysterical symptoms (425). Abundant limpid urine after the attack, but urine and feces are never passed involuntarily during an attack. The reflexes are not abolished during the attack as may occur in epilepsy (1058).	Hysterical convulsion, (1074).		586
		The convulsion always commences in one group of muscles and later extends over the whole or part of one side of the body and often over both sides. Jacksonian epilepsy (431).	If the convulsion remains unilateral, consciousness may or may not be lost, but it is always lost when the convulsion becomes bilateral.	There are usually present symptoms of serious brain disease.		The convulsion often commences with a motor (twitching), rarely with a sensory (tingling), aura. It spreads first through the whole of the part first attacked and then in a definite order from face to arm, or from arm to leg or face, or from leg to arm, according to the anatomical arrangement of the cortical motor centers; hence never from leg to face without the arm being involved. The convulsion is followed by a hemiplegia, sometimes transient, sometimes permanent and progressive. There may be muscular rigidity in the intervals between the convulsive attacks. Occurs in youth or middle age and often after traumatism of old date. Headache, vertigo and vomiting. Usually choked disc or optic neuritis. Symptoms steadily progressive. Similar attacks without choked disc may occur in localized meningitis or other irritative lesions in the cerebral cortex.	Cerebral Tumor (including abscess and cyst) in or near motor area of cortex. Jacksonian Epilepsy, (131, 507-8, 605).		587
						Occurs in old age and often after recent injury. Alcoholism, atheromatous arteries and insanity are common. Sudden apoplectic attack with improvement later. No choked disc. Symptoms progress paroxysmally, and after each paroxysm there is marked improvement.	Hemorrhage in or near motor area of cortex (pachymeningitis, etc.), (502, 1060).		588
	Hyperpyrexia.	Epileptiform convulsion.	Coma during and after the convulsion.			Occurs suddenly, after some prodromal symptoms such as headache, poor eyesight, etc., in persons who have been exposed to high temperatures. Delirium is usually present.	Sunstroke or Heatstroke, (960, 1068).		589
	Pyrexia.	Epileptiform con-convulsion. Coma during and usually after the convulsion.	Headache, backache and radiating pains, delirium, vertigo and vomiting, especially on change of posture, hyperalgesia (spinal and elsewhere), photophobia, etc., are early symptoms. Retraction of head, opisthotonus, etc. (265). Paralysis of cranial nerves (squint, etc.), cutaneous eruptions (herpes), tâches cérébrales and Kernig's symptom (319). Tonic spasm and paralysis are more common in basic inflammations, and clonic spasm in cortical inflammations.	Lumbar puncture gives a clear or cloudy, bloody or purulent fluid, under increased pressure containing globulin and many polymorphonuclear leucocytes.		By lumbar punctura, Weichselbaum's diplococcus almost always, or rarely the pneumococcus or other germs, may be found in the cerebro-spinal fluid. There is often an epidemic of the disease (Weichselbaum's diplococcus). Strong retraction of head.	Cerebro-spinal Meningitis, (608, 1214, 1226).	590 MENINGITIS (608, 1045)	591
						By lumbar puncture, pyogenic bacteria may be found in the cerebro-spinal fluid. Suppuration or an infected wound may be present, especially in the head. Suppuration in middle ear or mastoid, or in nasal sinuses, carbuncle or erysipelas of head or neck. Retraction of head may be less marked.	Purulent Meningitis, (1227).		592
				Lumbar puncture gives a clear fluid under increased tension and containing globulin and many mononuclear lymphocytes, and if the disease be acute, polymorphonuclear leucocytes.		By lumbar puncture tubercle bacilli may be found in the cerebro-spinal fluid. A tuberculous process may be found in some other part of the body. Grinding of teeth and hydrocephalic cry. Choked disc and choroid tubercles may occasionally be seen by ophthalmoscopic examination. Tuberculin skin test will be positive.	Tuberculous Meningitis (1228-9).		593
				Lumbar puncture gives a clear fluid under increased tension, but no increase of cellular elements.		By lumbar puncture no bacteria can be found in cerebro-spinal fluid. Many, if not all, of the general symptoms of meningitis may be present, but they are not so severe and are not so constant as in the other forms and are promptly relieved by the withdrawal of a moderate amount of the cerebro-spinal fluid.	Serous Meningitis, Meningismus. (1239).		594
		Coma during the convulsion.				May occur in children at the onset of any infectious disease, especially in one affecting the nervous system.	Febrile or toxic convulsion		595
						Is the result of some unusual metabolic changes within the body, and especially of intestinal putrefaction and other abnormal processes, often started by the ingestion of tainted meat and other poisons. Vomiting, tympanites, diarrhoea and foul smelling feces.	Auto-toxic convulsion, (576)		596

Chart XI b

Clonic or Tonic Spasm

571 CLONIC SPASM	LOCAL CLONIC SPASM	Pyrexia in very acute cases.	Shock-like spasms similar to that produced by an electric shock.	Begins in one arm and side and then to oppo	
		Apyrexia	A single or many times repeated spasm, rarely contracture, of one muscle or of a group of muscles, occurring in paroxysms which rather tend to subside on voluntary movements. Myoclonus. (265-70).	Occurs in face and more rarely in neck and arms.	T
				Begins in arms and may extend to legs, but almost never to face. Often the tendons play as in subsultus tendinum,	T
				Begins in side of face or in one arm or leg and may extend over one, or even both sides of body.	T
572 TONIC SPASM	GENERAL TONIC SPASM	Pyrexia	Spasm commencing in jaws.	There is the history of an infected wound or of jaws, occurring in paroxysms; also rigid in position of opisthotonus, emprosthotonus,	
			Spasm commencing in pharynx and oesophagus.	There is history of a bite by an animal (usua especially on sight of water. Spasmodic clo cough, opisthotonus and general spasm are light and accommodation. The stage of ex diagnosis must be made in such cases by the	
			Spasm commences in back of neck and in back.	There may be more or increase of cells in c	
		Apyrexia. If unconsciousness is present. See also epilepsia media (575).	Cerebellar ataxia is present (281).	A tonic spasm of sudden onset, the face not being affected.	Th Re
			Rigidity rather than spasm, not strong enough to prevent passive or voluntary movements (266).	Extremities and trunk attack may last min Rigidity of all muscles,	
			Spasm only at commencement of any action.	Spasm passes away as the action is continued, the muscles of the face usually escape altog fibers show marked hypertrophy. Closely a low exposure to cold with consequent reflex	
			Spasm mainly confined to hands and feet.	Bilateral painful tonic spasm of muscles of han tended. Increased mechanical (Trousseau's ciated with rickets or digestive disorders and It occurs in infectious diseases, in poisoning	
			General painful clonic, followed by tonic, spasm.	Spasm very general and nine poisoning. Death	
	LOCAL TONIC SPASM	Apyrexia.	Spasm only occurs when performing some accustomed act.	Occurs usually in small muscles and in those t gradual onset, steadily grows worse, and ren rather than spasm. Atrophy of the muscles the voice of singers, public speakers, etc.	
			Rather brief spasm of one or more muscles.	A spasm lasting minutes cough, oesophageal sp	
			More permanent spasm.	A contracture of a few or many muscles usuall efforts are made to overcome it. No muscle bling (674) or may consist in jumping or sl	
			A permanent contracture.	The muscles are anatomically shortened, in later stages.	Tendon reflexes are incre and lasts for years. U Absence of reflexes. Mu traction of tendon and fa

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS					ABSTRACTS OF SYMPTOMS					DIAGNOSIS	
571	CLONIC SPASM	LOCAL CLONIC SPASM	Pyrexia in very acute cases.	Shock-like spasms similar to that produced by an electric shock	Begins in one arm and side of neck and extends to leg of same side and then to opposite side.	Much pain in head and neck at onset. Weakness slowly follows the spasms. At times there is wasting of muscles and loss of faradic excitability. The spasms become violent and more continuous. Epileptiform attacks are common. Death results in a few months.				Dubini's Disease or Electrical Chorea, (627).	600
			Apyrexia	A single or many times repeated spasm, rarely contracture, of one muscle or of a group of muscles, occurring in paroxysms which rather tend to subside on voluntary movements. Myoclonus. (265-70)	Occurs in face and more rarely in neck and arms.	The spasms are almost always unilateral, and when bilateral are not symmetrical.	The spasms seem like mimic gestures and appear to be rather purposeful. May have originated from local irritation, but have persisted after the irritation has ceased.	Psychic disorders of an emotional or neurasthenic nature often present.	The contractures are accompanied by no pain. See also reflex spasm (617).	Convulsive Tic (blepharospasm, torticollis, etc.), (267, 270, 617, 703, 726).	601
									The contractures are accompanied by sharp darts of pain	Tic Douloureux, (267, 726, 947).	602
					Begins in arms and may extend to legs, but almost never to face. Often the tendons play as in subsultus tendinum,	The spasms are bilateral and fairly symmetrical, but not synchronous. They are irregular in force and rhythm.	The spasms never appear to be purposeful. No movement results, merely individual muscles spring forth in strong contraction. Irritation of the skin or tendons causes paroxysms.	Little or no emotional disturbances. Trembling of muscles between the paroxysms. The spasms become less, or entirely cease, during sleep. Reflexes exaggerated.	The muscles involved are attached by one end to the trunk of the body. Muscles of the face, hand and forearm, foot and lower legs almost never involved. No heredity. A disease of adult life	Friedreich's Paramyoclonus Multiplex.	603
									Many cases occur in the same generation of a family. The disease begins in early life and is associated with epilepsy and dementia.	Unverricht's Family Myoclonus Epilepticus.	604
					Begins in side of face or in one arm or leg and may extend over one, or even both sides of body.	The spasms are always unilateral at first.	The spasm may extend to adjacent muscles and so over one half the body and then jump across and involve both sides, or it may remain a local spasm and pass away in a short time. After many such local spasms, one may occur which will pass into a general convulsion. A general convulsion can sometimes be averted by tying a band tightly around the extremity as soon as the local spasm appears. Consciousness is always lost when the convulsion extends to both sides of the body; but usually persists when spasm is limited to one-half the body or to one extremity.			Jacksonian Epilepsy, (431, 587, 1282-3, 1291).	605
572	TONIC SPASM	GENERAL TONIC SPASM	Pyrexia	Spasm commencing in jaws.	There is the history of an infected wound or septic childbirth within a month, usually within two weeks. The infection may occur through the navel in new born babies (tetanus neonatorum). The characteristic symptom is rigid spasmodic closure of jaws, occurring in paroxysms, also rigidity of facial muscles producing "risus sardonicus." In the onset a gradually increasing stiffness of masticatory and other muscles followed by paroxysms of painful tonic spasms, the body being held in position of opisthotonus, emprosthotonus, pleurosthotonus or orthotonus (265). The spasms are associated with profuse sweating. There are no mental symptoms and no coma. Towards the fatal termination the temperature becomes very high.					Tetanus, (170). Tetanus traumaticus. Tetanus rheumaticus. Tetanus puerperalis. Tetanus neonatorum.	606
				Spasm commencing in pharynx and oesophagus.	There is history of a bite by an animal (usually dog or cat) within a year, usually within six months. The most striking features are tremor, rapid pulse, fever, mental depression, fright, horror and extraordinary emotional excitement, even mania, especially on sight of water. Spasmodic closure of pharynx and oesophagus, making swallowing, especially of fluids, impossible. Saliva cannot be swallowed and is expelled from the mouth with difficulty. Spasm of muscles of respiration, hiccough, opisthotonus and general spasm are common. Reflex acts from cutaneous or special sensory surfaces are greatly increased, especially that of inspiratory dyspnoea; and priapism occasionally occurs. The pupils are dilated and respond to light and accommodation. The stage of excitement is at times followed by a stage of paralysis and is often preceded by a prodromal stage of malaise and of pains, especially in the scar. Hysterical persons at times simulate hydrophobia. The diagnosis must be made in such cases by the presence of hysterical symptoms (425), absence of fever and by time.					Hydrophobia. Lyssa Rabies, (171).	607
				Spasm commences in back of neck and in back.	There may be more or less disturbance, or loss, of consciousness. Tonic retraction of neck, opisthotonus and boat-shaped retraction of abdomen. Headache, backache, delirium, Kernig's symptom. Lumbar puncture shows increase of cells in cerebro-spinal fluid. For different varieties see 590-4					Meningitis, Cerebral and Spinal, (508, 590, 831, 974, 1005, 1032, 1045, 1208-9-13).	608
			Apyrexia. If unconsciousness is present. See also epilepsia media (575).	Cerebellar ataxia is present (281).	A tonic spasm of sudden onset, the face not being affected.	The extremities on the same side as the lesion are adducted, on the opposite side abducted. Head, trunk and extremities each rotate about long axis from side of lesion to the opposite side and the eyes deviate towards the same direction.				Lesion of cerebellar hemispheres, (618, 686, 783, 1016).	609
						Retraction of the head and opisthotonus, flexion of elbows, supination of hands, extension of legs with pointing of toes.				Lesion of vermis of cerebellum, (618, 686, 783, 1011)	610
				Rigidity rather than spasm, not strong enough to prevent passive or voluntary movements (266).	Extremities and trunk remain in any position in which they may be placed for a surprisingly long time. Wax-like resistance to passive motion. Difficult positions maintained indefinitely without apparent effort. The attack may last minutes, hours or days. Anesthesia, abolition of reflexes, and apparently more or less complete loss of consciousness are usual symptoms. Other hysterical symptoms are often present, (425).					Catalepsy, (1096-8)	611
					Rigidity of all muscles, mask-like face, speech monotonus, passive tremor of hands and legs, characteristic attitude, festinating gait. Tendency to fall backwards or forwards (677).					Paralysis Agitans. Parkinson's disease, (677, 766, 880).	612
				Spasm only at commencement of any action	Spasm passes away as the action is continued, to return on first movement after a rest or when action is done faster. Patient cannot hurry or execute rapid movements. Is liable to lose equilibrium. The arms are less affected than the legs and the muscles of the face usually escape altogether. Marked heredity. Myotonic electrical reaction (402). Increased mechanical excitability of muscle, even slight pressure with the finger-tip causes a sluggish long continued contraction. Muscle fibers show marked hypertrophy. Closely allied to this disease is "paramyotonia congenita" (Eulenberg's disease) also on an hereditary basis (it has attacked twenty-eight members of a family in six generations) but these paroxysmal attacks follow exposure to cold with consequent reflex vaso-motor spasm and nutritive disturbances in the muscles. The so-called acquired form, "myotonia acquisita," is probably an altogether different disease					Myotonia Congenita. Thomsen's disease, (265, 1155), including Paramyotonia Congenita (Eulenberg's disease)	613
				Spasm mainly confined to hands and feet	Bilateral painful tonic spasm of muscles of hands and sometimes of feet, lasting minutes, hours, or rarely days. Hands and feet drawn into smallest volume possible with hollow deepened (obstetrical hand). Joints of arms flexed, those of legs extended. Increased mechanical (Trousseau's phenomenon (450)) and electrical (Erb's sign (452)) excitability of nerves. Facial nerve very irritable; so that slight blows on it cause spasm of facial muscles (Chvostek's sign (451)). Usually associated with rickets or digestive disorders and intestinal parasites, or dilated stomach; often follows extirpation of parathyroid glands. Sometimes occurs as a symptom of hydrocephalus, cerebral tumor or other serious brain disease in children. It occurs in infectious diseases, in poisoning and in pregnancy and as an occupation neurosis (616). In some cases this disease may be due to destruction of the parathyroid glands and may perhaps be cured by the administration of these glands					Tetany, (120).	614
				General painful clonic, followed by tonic, spasm.	Spasm very general and very painful, mainly in the form of opisthotonus (265). Periods of intermission with relaxed muscles lasting several minutes. Cutaneous and tendon reflexes increased. History or evidence of strychnine poisoning. Death usually results in a couple of hours					Strychnine convulsions, (297, 304).	615
		LOCAL TONIC SPASM	Apyrexia.	Spasm only occurs when performing some accustomed act	Occurs usually in small muscles and in those that have been overworked or improperly worked in doing the same act many times. The spasm is often painful, and in some cases pain may be the only symptom (neuralgic form). The spasm is of gradual onset, steadily grows worse, and renders the accustomed act difficult or impossible. It occurs only when the muscles are used. In some cases there is tremor, in others incoordination and in rare cases, paralysis or paresis (paralytic form) rather than spasm. Atrophy of the muscles involved is common. Patients are usually neurasthenic. Many varieties. writer's, telegrapher's, pianist's, violinist's, seamstress', shoemaker's, etc., cramp. A similar neurosis occasionally affects the voice of singers, public speakers, etc.					Occupation Neuroses, (143).	616
				Rather brief spasm of one or more muscles.	A spasm lasting minutes or hours, due to local irritation in neurasthenic patients. Functional in its nature. Many varieties. Blepharospasm, torticollis, spasmodic croup, laryngismus stridulus, bronchial asthma, whooping cough, oesophageal spasm, urethral spasmodic stricture, vesical spasm, tenesmus, etc. See also the convulsive tics (601).					Reflex spasm, (601, 637, 1194)	617
				More permanent spasm.	A contracture of a few or many muscles usually associated with anesthesia of the part. Usually there is a combination of spasm of flexors and extensors, such as is not seen in organic disease. A functional spasm, which becomes greater the more efforts are made to overcome it. No muscle atrophy. At times may be cured by ovarian pressure or by faradization. Other hysterical symptoms (425). Hysterical spasms are not always in the form of contracture. They may consist in trembling (674) or may consist in jumping or skipping (saltatory spasm).					Hysterical contracture.	618
				A permanent contracture.	The muscles are anatomically shortened, in later stages.	Tendon reflexes are increased when the spasm does not prevent their occurrence. Little or no muscular atrophy. The spasm is limited to the arm and leg of the same side and follows an attack of apoplexy, by a few weeks and lasts for years. Usually there is flexion of elbow, wrist and fingers, and extension of knee. Is associated with a sclerosis of the pyramidal tract and indicates a hopeless prognosis as to recovery from the hemiplegia.				Post-hemiplegic contracture, (504, 577).	619
						Absence of reflexes. Much muscular atrophy. Is limited to the distribution of one or more nerves. Follows disease of nucleo-peripheral motor neurons. Occurs in fingers. Dupuytren's contracture seems to be due to contraction of tendon and fascia rather than of muscle.				Post-neuritic contracture. Dupuytren's contracture.	620

Chart XI c

Choreiform and Athetoid Spasms

CHOREIFORM SPASM

Diagnostic Symptoms and Tests					Abstract of Symptoms	Diagnosis		
573 CHOREIFORM SPASM (272)	GENERAL	TRUE CHOREIFORM MOVEMENTS	Widespread spasmodic contractions.		Irregular, quick, involuntary, spontaneous contractions, first of one and then of another group of muscles throughout the body or limited to one-half of the body (hemichorea). Patient is restless and fidgety. Speech is explosive. Sounds are often made involuntarily. The movements have somewhat the character of purposeful movements, but resemble more closely extreme restlessness: grimaces, thrusting out of tongue, twisting of hands and feet, etc. Some muscular weakness (Choreic paralysis (510) is present; and almost always marked hypotonia or atonia (39, 252, 472)). Voluntary movements are interfered with and made incoordinate by the occurrence during them of these involuntary contractions (ataxia). The part cannot be held still. These choreic movements may be slight, or so strong as to prevent walking or eating or speaking. They cease during sleep, but to some extent prevent sleep. They are worse under observation and excitement. Reflexes are normal but the knee-jerk may be protracted and the foot sink back only slowly. Paresthesiae and anesthesia rarely present.	Common in children, rare in adults. Slight mental disturbances often present. Often associated with rheumatism and endocarditis, rarely with pregnancy, (Chorea gravidarum).	Sydenham's, or Infectious, Chorea. Chorea Minor.	622
						Occurs only in adults. There is much and progressive mental impairment. Movements coarser and more violent. Heredity.	Huntingdon's, or Hereditary, Chorea (103).	623
						Occurs only in old persons with atheromatous arteries and brain symptoms. Speedy death usually.	Senile, or Degenerative, Chorea.	624
						Occurs in hemiplegia, (after apoplexy, etc.) and is confined to the incompletely paralysed extremities, especially the hand and arm. It is most frequent in the hemiplegias of childhood.	Post-hemiplegic Chorea.	625
			Limited to one group of muscles.		Involuntary, often unconscious, or unnoticed, execution of the same act at short intervals. Little "tricks" which characterize many persons such as: coughing, hemming, winking, etc. Each person has his own individual trick or habit and rarely varies from it. Usually occurs in neurasthenics.		Habit Chorea or Habit Spasm (274).	626
		PSEUDO-CHOREA	Sudden, lightning-like contractions of groups of muscles.		The spasms are painful and instantaneous; the platysma, sterno-cleido-mastoid and hypoglossus muscles are especially affected. It is a rare disease, occurring especially in Northern Italy. In the later stages epileptiform convulsions and paralyses with atrophy occur. Ofter fatal. This disease is probably not at all related to chorea minor.		Electric Chorea. Dubini's disease (600).	627
			A coarse tremor rather than choreiform movements	Usually limited to one extremity.	Rhythmical trembling of an extremity, varying in intensity. At times so coarse and irregular as to resemble chorea, at other times more like electric shocks. Other symptoms of hysteria present (425). The extensive convulsive movements sometimes called chorea magna or major (273), are purely hysterical and are not choreic in their nature.		Rhythmical, or Hysterical, Chorea.	628

ATHETOID SPASM

	Diagnostic Symptoms and Tests	Abstract of Symptoms	Diagnosis
574 ATHETOID SPASM LOCAL (271 507)	A slow contraction of one set after another of small muscles of the hand; rarely of the foot (Mobile spasm). Ankles and wrists frequently also involved. Squirming, twisting motion of fingers, extension and hyperextension predominating. The athetoid spasm is increased by voluntary movements of the same or of the other hand. The face muscles may rarely be affected in bilateral athetosis. The extremity or extremities involved are always weak but never paralysed. The spasm may be unilateral or bilateral. Usually in hands, more rarely in feet. These movements, though slow, are powerful and at times cause sub-luxation of joints.	The athetoid spasm is present from birth. It is very rarely unilateral, more frequently bilateral. There is much mental impairment, even idiocy.	Congenital 629 Athetosis.
		Present from birth or infancy. Some mental impairment. Unilateral or bilateral. Associated with a mild hemiplegia or diplegia. Rare.	Athetosis 630 after cerebral palsy of childhood.
		Occurs in adult life after an attack of apoplexy. Usually unilateral. Rare.	Athetosis 631 after apoplexy.

Chart XII
Perversion of Motion
and
Local Palsies and Spasms

DIAGNOSTIC ANALYSIS OF SYMPTOMS

Symptom Analysed	Character	
635 PERVERSIONS OF MOTION (243)	638 ATAXIA (248)	The diseases in which ataxia occurs are set forth in Chart XII a.
	639 TREMOR (250)	The diseases in which tremor, nystagmus, or fibrillation occurs are set forth in Chart XII b.
	640 NYSTAGMUS (291)	
	641 FIBRILLARY CONTRACTION OR FIBRILLATION (292)	

LOCAL PALSIES AND LOCAL SPASMS

636 LOCAL PALSIES	See Chart XII c.
637 LOCAL SPASMS	See Chart XII d.

Chart XII a

Ataxia

638 ATAXIA (218)

- 642 Ataxia mainly upon standing or walking. Staggering gait. (Static ataxia. Cerebellar ataxia (281)).
  - No loss of muscle sense. No motor paralysis, except in late stage of 651-2.
    - Occurs at any age, usually in adults. Usually sensory symptoms
      - Sight and hearing normal. — Patie ny Hy
      - Sight or hearing abnormal. — Stag m: at no
    - Occurs in youth. No sensory symptoms. — Occurs in family groups a though less pronounced. mus is common and spe
- 643 Inability to stand or walk. More or less complete.
  - Bilateral. — Many sensory symptoms. — Evidently functional. — Legs (2
  - Unilateral. (Hemiataxia.) — Often analgesia and thermic anesthesia. — Evidently organic. — No l lyi
- 644 Ataxia of all movements. (Dynamic Ataxia. Motor Ataxia (280)).
  - Unilateral. (Hemiataxia.) — Loss of muscle sense and sensory symptoms usually prominent. Knee-jerk usually increased. — When of acute course the ally follows an apoplecti arterial disease is pres chronic course choked present.
  - Bilateral.
    - Knee-jerks normal. — No ankle-clonus. — His
    - Exaggerated knee-jerks, ankle-clonus and Babinski.
      - Great variety of local sym are intention tremor, sc ness. Rarely the diseas point is the presence of
      - A combination of sympto usually lost before any Knee-jerks may be abol
    - Knee-jerks and ankle-clonus absent. No Babinski. Often loss of muscle sense and retardation of conduction of pain.
      - Rarely any permanent mo ball) are not uncommon held well apart and feet symptom (448), Argyll-R sensations and paresthe gesia in patches and in in cerebro-spinal fluid. There are several form legs are mainly affected
      - Slight motor paralysis is normal. Cranial nerves never so chronic as tabe
  - Irregular distribution. — Knee-jerks usually exaggerated, but no Babinski or ankle-clonus. Evidently functional (pseudo-ataxia).
    - Hist
    - Em

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS					ABSTRACT OF SYMPTOMS	DIAGNOSIS	
638 ATAXIA (248)	642 Ataxia mainly upon standing or walking. Staggering gait. (Static ataxia. Cerebellar ataxia (281)).	No loss of muscle sense. No motor paralysis, except in late stage of 651-2.	Occurs at any age, usually in adults Usually sensory symptoms	Sight and hearing normal.	Patient exhibits the staggering, irregular gait of a drunken man. Little ataxia of movements of hands, or of legs when lying down. Vertigo, vomiting and headache are often present. Choked disc or nystagmus may be present (tumors). Knee-jerks may be present or absent (usually present). Cerebellar fits (609-10) may occur. Symptoms may be bilateral or unilateral (same side as lesion). Hypotonia is present.	Lesion of cerebellum or its tracts, (609-10, 686, 783, 1016, 1272)	648
				Sight or hearing abnormal.	Staggering gait, constantly or paroxysmally. Headache, vertigo and vomiting at times. No choked disc. Knee-jerks normal. Diplopia or other disorders of sight Vertigo ceases when eyes are closed.	Ocular ataxia or vertigo, (1020).	649
					Deafness and ringing in one ear Paroxysmal attacks of intense vertigo and defect in bone conduction are frequent symptoms.	Aural ataxia or vertigo. Ménière's Disease, (650, 685, 918, 1019)	650
			Occurs in youth. No sensory symptoms.		Occurs in family groups and shows well marked heredity usually. Staggering gait, but ataxia also in arms though less pronounced. A general coarse irregular tremor, simulating jerky choreiform movements. Nystagmus is common and speech often defective. Symptoms present a mixture of weakness and ataxia. Occurs after puberty. Knee-jerks present. Ocular paralysis, loss of pupil reflex and optic atrophy common	Marie's hereditary cerebellar ataxia, (669-70, 782).	651
					Occurs before puberty Knee-jerks absent, except in early stage. Optic atrophy rare Club-foot common.	Friedreich's Disease Hereditary Ataxia, (670, 687, 762, 781).	652
	643 Inability to stand or walk. More or less complete.	Bilateral.	Many sensory symptoms.	Evidently functional.	Legs can be moved easily in all directions without ataxia when patient is lying down, but collapse when she tries to walk, apparently from lack of confidence and will power Simulates an apraxia (230) rather than an ataxia Often has an emotional cause and hysterical symptoms (425) are present. Both legs are involved.	Astasia and Abasia, (287, 792).	653
		Unilateral (Hemiataxia)	Often analgesia and thermic anesthesia.	Evidently organic.	No loss of muscle sense May or may not be motor paralysis of same side with analgesia and thermic anesthesia of contralateral side One leg only involved. No ataxia when moving leg while lying down	Lesion of lateral column of spinal cord, involving direct cerebellar tract, (648, 1356, 1360).	654
	644 Ataxia of all movements. (Dynamic Ataxia. Motor Ataxia (280)).	Unilateral. (Hemiataxia)	Loss of muscle sense and sensory symptoms usually prominent Knee-jerk usually increased.	When of acute course the condition usually follows an apoplectic attack Often arterial disease is present. When of chronic course choked disc may be present.	Marked anesthesia without analgesia. No motor paralysis. No other symptoms. Very rare May be the earliest stage of a spinal tumor. Unilateral later becoming bilateral.	Lesion of posterior column of cord, (785)	654a
					Apoplectiform attack followed by hemiplegia (sensory oftener than motor). Other post-hemiplegic motor disturbances are often present. The ataxia occurs in convalescence in cases where the motor paralysis was slight.	Post-hemiplegic ataxia (lesion in or near posterior part of optic thalmus).	655
					There are often ataxia and loss of muscle sense on one side of body and analgesia and thermic anesthesia on the other side. There may be crossed paralysis Dysphagia and dysarthria and paralysis of various cranial nerves are usually present.	Softening, hemorrhage or tumor in brain stem, (535 et seq., 839)	656
					Signs of cortical irritation (convulsions). Anesthesia, especially loss of muscle sense, is often present. Headache common. May be some mental disturbance	Softening or tumor of contralateral pareital cortex.	657
		Bilateral.	Knee-jerks normal.	No ankle-clonus.	History of alcoholism Blurred and foolish speech. Ataxia and other symptoms. Temporary tremor.	Alcoholic intoxication, (663, 673, 764, 780).	658
			Exaggerated knee-jerks, ankle-clonus and Babinski.		Great variety of local symptoms Usually both motor and sensory symptoms. Irregular, jerky, ataxic movements of both arms and legs, and movements are slow. Gait is often both spastic and ataxic Very characteristic are intention tremor, scanning speech, nystagmus, especially on motion of eyeball, and atrophy of optic nerve. In some cases bulbar paralysis (434) is an early symptom Patients are often emotional and exhibit mental weakness Rarely the disease runs an acute course and has been called "acute ataxia," of which there are several varieties (662) In its early stages this disease is often of exceedingly difficult diagnosis. The most essential point is the presence of symptoms only explicable on the assumption of the existence of several, separate, small lesions.	Disseminated Sclerosis Myelitis Disseminata. Encephalomyelitis, (511, 580, 668, 688, 755, 765, 769, 913, 1051)	659
					A combination of symptoms of locomotor ataxia (661) and spastic paraplegia (525) in varying proportions Little or no pain Weakness, stiffness, ataxia, paresthesiae and anesthesia of legs. Vibration sense (56, 353) is usually lost before any anesthesia can be detected. In later stages arms may be somewhat involved. A rare disease Occasionally some involvement of cranial nerves. Organic reflexes slightly, or not at all, disordered. Knee-jerks may be abolished towards the end of the disease, but Babinski persists.	Ataxic Paraplegia. Combined Sclerosis, 526, 761 796).	660
			Knee-jerks and ankle-clonus absent. No Babinski. Often loss of muscle sense and retardation of conduction of pain.		Rarely any permanent motor paralysis; but hypotonia (252), allowing hyperextension and extreme mobility of joints, is common, and temporary paralyses in the domain of the cranial nerves (especially the muscles of eyeball) are not uncommon early symptoms. Movements are ataxic, quick, violent, excessive and constantly controlled by eyesight. The affected parts cannot be held motionless in one position long In walking, legs are held well apart and feet are flung too far outward and too far forward and are brought back hard on heel. Ataxia much worse when eyes are closed. Walking in the dark or backwards is usually impossible Romberg's symptom (448), Argyll-Robertson's phenomenon' (147), myosis and optic atrophy with concentric limitation of field of vision are common. Lightning pains of great intensity in small areas followed by hyperalgesia, girdle sensations and paresthesiae are prominent symptoms Organic reflexes, especially the vesical, are disordered Arthropathies (1186), or perforating ulcer or other trophic disorders may be present. Anesthesia and analgesia in patches and in cuirass (ulnar hypesthesia). Retardation of conduction of pain Visceral crises (987) are usually present. Towards the end of the disease motor paralysis may appear. Lymphocytosis and globulin in cerebro-spinal fluid. The disease is sometimes divided into three stages—(1st), the neuralgic; (2nd), the ataxic; (3rd), the paralytic stage. History or other evidences of syphilis, or of venereal disease is usually present There are several forms of tabes. In the cerebral form, atrophy of the optic nerve is the prominent symptom and the legs show little ataxia. In cervical tabes the arms are mainly affected In the ordinary form the legs are mainly affected. In all forms the knee-jerks are absent	Locomotor Ataxia. Tabes Dorsalis, 755, 784, 827, 894, 979, 987, 1004, 1216, 1231).	661
					Slight motor paralysis is present. Muscle tender and atrophic. Pains rarely very severe and partial reaction of degeneration and retardation of conduction of pain often present. Organic reflexes normal Pupil reaction normal. Cranial nerves rarely involved. Usually sensory symptoms. Usually history of alcoholic abuse Mental disturbances in many cases. Occasionally the disease runs an acute course, "acute ataxia," (659) and is never so chronic as tabes. No globulin or lymphocytosis in cerebro-spinal fluid. Prognosis is good.	Multiple Neuritis Polyneuritis. Pseudo-tabes, (488, 787, 823, 1008 1147, 1307)	662
		Irregular distribution.	Knee-jerks usually exaggerated, but no Babinski or ankle-clonus. Evidently functional (pseudo-ataxia).	History of taking drugs, alcohol, etc	The ataxia is usually associated with tremor and neurasthenic symptoms Failure of memory and other signs of mental impairment. Patients are emotional and excitable.	Drug habit (toxic), (658, 673, 763, 780).	663
				Emotional cause.	The ataxia may appear only when eyes are closed and is usually associated with cortical anesthesia. Hysterical symptoms (425) are present Rarely fall, but usually collapse on reaching a place of safety.	Hysterical Ataxia, (1074)	664

Chart XII b

Tremor, Nystagmus, Fibrillation

- 639 TREMOR (250)
  - 645 Intention Tremor (290).
    - Coarse, irregular tremor; 5 or 6 per second.
      - Tremor is usually associated with scanning speech, nystagm
        Usually a great variety of motor and sensory symptoms c
        variable area. The sensory symptoms are usually in the l
      - Occurs in family groups and shows well marked heredity. Staggering gait. Ataxia. Nystagmus is common and speech often defective.
        - Occurs after pu
        - Occurs before p
    - Fine tremor.
      - Tremor is associated with general weakness or convalescenc
  - 646 Passive Tremor. Increased on voluntary motion and excitement (289).
    - Fine, rapid tremor; 8 to 12 per second.
      - Exophthalmus, goitre, tachycardia, vascular throbbing, flus
        symptom).
      - History of addiction to alcohol or drugs. Mental symptom
      - Presence of hysterical symptoms (425). Tremor is worse w
      - Tremor is marked in face, lips and tongue. Progressive me
        ocytosis and globulin in cerebro-spinal fluid. Argyll-Rob
    - Slow tremor; 5 to 6 per second.
      - Slow tremor of hand and foot of same side, associated with
      - Tremor, which is associated with muscular rigidity and mask-
        involves the other side. The tremor is most marked in th
        acteristic attitude (head and body bent forward, elbows f
        ilar tendency to run backwards (retropulsion). The attit
        Voluntary movements are slow, much restricted and feel
        helpless.
  - 647 Passive Tremor. Diminished on voluntary motion (289).
    - Slow, fine tremor; 5 to 6 per second.
      - Tremor begins bilaterally. Head is early affected. Noddin
    - Slow, coarse tremor.
      - Rotatory or nodding tremor of head occurring suddenly in
        involved. The tremor ceases when the child's eyes are c
      - A series of jerky tremors limited to the back, or involving
  - Either Intention or Passive Tremor.
    - Not associated with other nervous symptoms. Hereditary

- 640 NYSTAGMUS (291)
  - Always a symptom of organic disease. Very rarely, an hysterical clonic spasm may simulate true nystagmus (pseudo-nystagmus). This is often vertical and is more rapid and more violent than nystagmus and is associated with other hysterical symptoms.
  - No weakness of any rectus muscle.
    - Impairment of sight.
      - Defective vision from whatever caus
      - Due to lack of pigment in iris, choro
      - Workers in mines. Due to working
    - No impairment of sight.
      - Vertigo is a prominent symptom.
        - Paroxysmal att
          violently, or
        - Vertigo, cerebel
      - Coarse, jerky tremor is a prominent symptom. Ataxia is also present.
        - Occurs in early
        - Occurs at any
      - Cerebral symptoms present.
        - Occurs in meni
      - Rickety baby in winter.
        - Most marked w
          ing of the he
      - Congenital.
        - Lateral oscillat
  - Weakness of one or more of the recti muscles.
    - Nystagmus occurs in convalescence

- 641 Fibrillary Contraction or Fibrillation (292).
  - Evidence of organic disease. Degeneration of peripheral motor neurons.
    - Marked muscular atrophy with muscular weakness.
      - Marked sensory symptoms.
        - Analgesia and
      - No sensory symptoms.
        - Muscular atrop
        - Muscular atrop
        - Muscular atrop
  - Evidence of functional not organic diseases.
    - No muscular atrophy or weakness.
      - Occurs usually

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS				ABSTRACT OF SYMPTOMS	DIAGNOSIS	
639 TREMOR (250)	645 Intention Tremor (290).	Coarse, irregular tremor; 5 or 6 per second.		Tremor is usually associated with scanning speech, nystagmus atrophy of optic nerve and ataxia. Reflexes are usually exaggerated and ankle-clonus and Babinski are present. In some cases the deep reflexes are early abolished and the organic reflexes disordered. Usually a great variety of motor and sensory symptoms due to many local lesions. The motor symptoms commence as fatigue, slowly becoming paresis, rarely paralysis, and are usually associated with exaggerated reflexes, occasionally with their loss, over a very variable area. The sensory symptoms are usually in the form of paresthesiae, more rarely pain followed by irregular patches of anesthesia. Epileptiform or apoplectiform attacks followed by transitory paralysis are common. Vertigo is a very common symptom.	Multiple Sclerosis. Disseminated Sclerosis, (511, 580, 659, 688, 755, 765, 799, 913, 1051).	668
			Occurs in family groups and shows well marked heredity. Staggering gait. Ataxia. Nystagmus is common and speech often defective	Occurs after puberty Knee-jerks are present. Ocular paralysis, loss of pupillary reflex and optic atrophy are common.	Marie's Hereditary Cerebellar Ataxia, (651, 782).	669
				Occurs before puberty. Knee-jerks are absent except in early stage. Optic atrophy rare Club-foot common.	Friedreich's Hereditary Ataxia, (652, 687, 762, 781).	670
		Fine tremor.		Tremor is associated with general weakness or convalescence from an acute disease. Anemia is usually present, but no evidence of any organic disease of the nervous system	Asthenic Tremor or weakness, (790).	671
	646 Passive Tremor Increased on voluntary motion and excitement (289).	Fine, rapid tremor; 8 to 12 per second.		Exophthalmus, goitre, tachycardia, vascular throbbing, flushing, sweating, diarrhoea, much nervousness, polyuria and at times albuminuria, insomnia and vertigo are common symptoms. The upper lid does not fall normally when patient looks downward (Graefe's symptom).	Exophthalmic Goitre. Basedow's Disease. Graves' Disease, (1193).	672
				History of addiction to alcohol or drugs. Mental symptoms are common, moral sense and judgment impaired and speech blurred. Patient is restless and emotional. Pupils contracted in opium cases. Quinquaud's sign (453) in alcoholic cases.	Toxic Tremor (alcohol, opium, nicotine, mercury, etc.), (658, 663, 780).	673
				Presence of hysterical symptoms (425). Tremor is worse when attention is directed to it Irregular tremor Evidence of great exhaustion of the nervous system. Often history of injury associated with fright	Hysterical or Neurasthenic Tremor and also Traumatic Neuroses, (1074).	674
				Tremor is marked in face, lips and tongue. Progressive mental impairment Restless and childish. Speech is slurred by elision of syllables and letters. Apoplectiform and epileptiform attacks may occur. History of syphilis Lumbar puncture shows a lymphocytosis and globulin in cerebro-spinal fluid. Argyll-Robertson's phenomenon.	Paralytic Dementia. General Paresis. Paresis, (579, 763, 895, 1049, 1104, 1215, 1230).	675
				Slow tremor of hand and foot of same side, associated with ocular motor paralysis of the opposite side Other symptoms of a severe brain lesion. May be associated with hemiplegia, sensory or motor Tremor ceases during sleep and is increased in excitement	Lesion of the Crus Cerebri or Pons involving the Rubro-spinal tract, (441, 1325)	676
		Slow tremor, 5 to 6 per second.		Tremor, which is associated with muscular rigidity and mask-like face, consists of "pill rolling" movements of fingers and general tremor, which commences in one extremity, later extends to the other extremity of the same side (rarely to that of the opposite side) and finally involves the other side The tremor is most marked in the fingers and hands, the head and body escape, except in very rare cases. Disease commences after forty years of age and progresses slowly The tremor usually becomes coarser in the later stages Characteristic attitude (head and body bent forward, elbows flexed, knees slightly flexed) and festinating gait or propulsion: a tendency to fall forward which compels patient to walk faster and finally to run until he falls forwards or against an obstacle He has a similar tendency to run backwards (retropulsion). The attitude, gait and mask-like face are all due to muscular rigidity which is more characteristic of the disease than is the tremor, and in rare cases occurs alone without any tremor (paralysis agitans sine agitatione). Voluntary movements are slow, much restricted and feeble, but are never completely paralysed There are no sensory symptoms except the sensation of rigidity and a feeling of heat, which are frequent and distressing symptoms. Patient slowly becomes entirely helpless.	Paralysis Agitans. Parkinson's Disease, (612, 766, 800)	677
	647 Passive Tremor. Diminished on voluntary motion (289).	Slow, fine tremor; 5 to 6 per second.		Tremor begins bilaterally. Head is early affected. Nodding movement No rigidity General weakness. Atheromatous arteries.	Senile Tremor.	678
		Slow, coarse tremor.		Rotatory or nodding tremor of head occurring suddenly in rickety babies in the winter time and passing off in the summer time Usually accompanied by nystagmus which grows worse when the child's head is held still. Occasionally other muscle groups are involved. The tremor ceases when the child's eyes are closed.	Spasmus Nutans. Nictitatio Spastica, (690).	679
				A series of jerky tremors limited to the back, or involving all muscles, caused by cold (physiological) or infection (pathological) and resulting in an increase in the body's temperature and may be followed by high fever.	Chills. Rigors. Shivering.	680
	Either Intention or Passive Tremor.			Not associated with other nervous symptoms. Hereditary basis (alcoholism in ancestors, etc). May be local or general. Usually in advanced age.	Essential Tremor.	681
640 NYSTAGMUS (291) Always a symptom of organic disease. Very rarely, an hysterical clonic spasm may simulate true nystagmus (pseudo-nystagmus) This is often vertical and is more rapid and more violent than nystagmus and is associated with other hysterical symptoms.	No weakness of any rectus muscle	Impairment of sight.		Defective vision from whatever cause, congenital or acquired, in early childhood. Often associated with blepharospasm and oscillation of head.	Amblyopia, (359).	682
				Due to lack of pigment in iris, choroid, etc. Usually associated with photophobia.	Albinism.	683
				Workers in mines. Due to working in poor light and looking sideways constantly while at work.	Miner's Nystagmus.	684
		No impairment of sight	Vertigo is a prominent symptom	Paroxysmal attacks of vertigo associated with deafness and tinnitus aurium and due to disease of inner ear Nystagmus in the opposite direction from the labyrinth involved occurs occasionally when head is rotated violently, or galvanized, or ear syringed, or labyrinth in any way irritated. The caloric reaction (79) is absent.	Ménière's Disease. Aural vertigo. Labyrinthine Vertigo, (650, 918, 1019).	685
				Vertigo, cerebellar ataxia and other symptoms of disease of the cerebellum. The nystagmus is usually towards the side of the lesion.	Cerebellar Disease, (609-10, 648, 783, 1016, 1272).	686
			Coarse, jerky tremor is a prominent symptom. Ataxia is also present.	Occurs in early youth Strong heredity. Knee-jerks absent, except in early stage. Optic atrophy rare.	Friedreich's Hereditary Ataxia, (670).	687
				Occurs at any age. No heredity Intention tremor. Exaggerated knee-jerk and Babinski Optic atrophy and scanning speech common. Vertigo is usually present (932)	Disseminated Sclerosis, (668, 765).	688
			Cerebral symptoms present.	Occurs in meningitis and in local lesions (tumors especially) Nystagmus is commonly present in bulbar lesions, especially in those involving the cerebellar peduncles and tracts and the posterior longitudinal bundle.	Cerebral Disease (especially of the brain stem).	689
			Rickety baby in winter.	Most marked when the child's head is held still and the tremor prevented (679) Not to be confounded with the deep bowing (Salaam cramp) which occurs in some idiots and epileptics, with or without nystagmus. Rolling of the head may occur in otitis media and in rickety children.	Spasmus Nutans. Nictitatio Spastica, (679).	690
			Congenital.	Lateral oscillating nystagmus associated with jerking movements of the limbs or trunk, aggravated by cold and by percussion. Associated with other congenital defects.	Nystagmus-myoclonus.	691
	Weakness of one or more of the recti muscles.			Nystagmus occurs in convalescence from ocular palsies or when weakened muscles are strongly exerted.	Ocular Muscular Insufficiency, (816).	692
641 Fibrillary Contraction or Fibrillation (292).	Evidence of organic disease. Degeneration of peripheral motor neurons.	Marked muscular atrophy with muscular weakness.	Marked sensory symptoms	Analgesia and thermic anesthesia with only slight anesthesia, or none at all. Trophic disturbances and mutilation. Slight tactile impressions are often painful	Syringomyelia, (552, 837, 1009, 1170, 1187).	693
			No sensory symptoms	Muscular atrophy and fibrillary contraction of tongue and lips, dysarthria, dysphagia and spastic paraplegia.	Chronic Bulbar Paralysis, (546, 1150)	694
				Muscular atrophy and fibrillary contraction of small muscles of hands and of shoulder girdle combined with spastic paraplegia	Amyotrophic Lateral Sclerosis, (547, 797, 1149).	695
				Muscular atrophy and fibrillary contraction of the peronei muscles. Rarely there are pain, muscle twitching and anesthesia.	Spinal or Neuritic Muscular Atrophy, (496).	696
	Evidence of functional not organic diseases.	No muscular atrophy or weakness.		Occurs usually in orbicularis palpebrarum but may occur in any muscle. It consists in a quivering of the muscle fibers and occurs in neurasthenic and exhausted persons.	Myokymia. Myoclonia, (293).	697

Chart XII c

Local Palsies

636
LOCAL
PALSIES

The anesthesia accompanying these palsies can be seen from the areas of cutaneous distribution of these nerves depicted in the plates at the end of the book (Fig. 32-3). In mild lesions of the nerves anesthesia is either absent or much less marked and less extensive than the motor paralysis.

Abstract of Symptoms	Diagnosis	
There are ptosis and strabismus divergens and the pupil is dilated and immobile both to light and accommodation (this condition of the pupil may occur as an isolated paralysis, see 333). The eyeball can be moved in no direction except outward (abducens), and outward and downward with rotation of eyeball (superior oblique). For symptoms characteristic of the isolated paralysis of each ocular muscle see Chart XIV, 816. When the superior oblique muscle is paralysed the levator palpebrae superioris is paralysed with it and ptosis results. The ocular muscles, except the levator palpebrae superioris, have a bilateral cortical representation. Hence ocular paralyses, except ptosis, almost never occur in lesions above the oculomotor nucleus, except in bilateral lesions. The cortical representation of the ocular muscles seems to be very diffuse or multiple. Conjugate deviation may result from supra-nuclear lesions.	Paralysis of Motor Oculi. (Fig. 18).	700
For the symptoms of paralysis of the trochlearis (patheticus) nerve and of the abducens nerve, each of which produces a strabismus convergens, see 816.	Paralysis of Trochlearis and of Abducens.	701
The muscles of mastication of one side, rarely of both sides, are paralysed and in severe cases atrophied. The temporal and masseter muscles cannot be felt firmly contracting when efforts are made to chew. The jaw cannot be closed tightly or moved laterally towards the healthy side (external pterygoids), or the chin pushed forwards (internal pterygoids). Mastication of food is difficult or impossible; dysmasesis (286). The jaw reflex (322) is abolished. In some cases one side of the soft palate is paralysed and in some the hearing of low tones is unpleasant. In trigeminus lesions there is unilateral abolition of the conjunctival, corneal, sneezing and palatal reflexes; and the secretion of tears is at times affected. There is no irritation, or tears, from inhaling ammonia or acetic acid. There is also loss of sense of taste, and dilatation of the pupil, narrowing of the eyelid slit, even enophthalmus, are present. Heat and redness of skin in recent cases and coldness and cyanosis of skin in old cases. The salivary secretion and taste are affected when either the proximal or the distal end, but not the middle, of the nerve is affected.	Paralysis of motor branch of Trigeminus.	702
The muscles of expression of one side (rarely of both sides) of the face are paralysed. The forehead cannot be wrinkled and the eye appears larger than normal and cannot be closed (lagophthalmus, hare's eye). When attempts are made to close the eyelids the eyeball turns upward, the cornea disappearing behind the upper lid (Bell's phenomenon). The angle of the mouth is lower than normal and cannot be raised. The naso-labial fold is obliterated. The lips cannot be firmly closed; so that whistling is impossible and speech is impaired. Mastication is difficult because the weakened buccinator muscle allows food to collect between the jaws and the cheek. The platysma is also paralysed; so that the angle of the mouth cannot be drawn downwards. Tears may flow from the eye and irritate the cheek and saliva from the angle of the mouth. The conjunctiva may become inflamed and the cornea ulcerated, because the eyelid cannot wink and keep the conjunctiva clean. In some cases the facial paral-	Facial Paralysis. Bell's palsy. Prosopoplegia. Facial Monoplegia. Facial Diplegia, (703, 1317).	703

	ABSTRACT OF SYMPTOMS	DIAGNOSIS	
LOCAL PALSIES (Continued)	ysis may be preceded and accompanied by pain. In severe cases the paralysed muscles exhibit the electrical reaction of degeneration. Hearing and taste are frequently impaired and disordered. When taste is affected the salivary secretion is also affected In the early stages of the disease the face is drawn over toward the healthy side by the unantagonized healthy muscles. In the later stages the face may be drawn back again towards the paralysed side by the contracting newly formed connective tissue in the degenerated muscles. Also in the early stage of recovery the face may be drawn towards the paralysed side by over-innervation of the muscles formerly paralysed. The upper fibres of the facial nerve have a bilateral cortical representation as do the laryngeal nerves. Hence lesions of the cerebral hemispheres paralyse only the lower branch of the facial. For the localization of the different forms of facial paralysis, see 1317.		
	Paralysis of the pneumogastric nerve is discussed under 760. In addition to the laryngeal paralysis there is often present disorder of the respiratory act and of the heart beat (tachycardia).	Pneumogastric Paralysis (760).	704
	When the tip of the shoulder sinks downwards and forwards and the arm cannot be easily raised, there may be a paresis of the trapezoid muscle. When this muscle is paralysed on both sides, the head tends to fall forward. When the head is drawn towards one shoulder and the chin turned upwards and towards the other, the sterno-cleido-mastoid muscle is paralysed on that side toward which the chin turns. This posture is called caput obstipum spasticum, when the muscle is atrophied and secondarily contracted and the deformity can no longer be corrected by passive motion. Caput obstipum spasticum occurs also and is more pronounced in torticollis from spasm of the muscle (730). When the sterno-cleido-mastoid muscle is paralysed on both sides, the head tends to fall backwards.	Paralysis of the Spinal Accessory.	705
	The tongue when protruded turns towards the paralysed side. When both sides are paralysed the tongue cannot be protruded at all, and in such cases, speech, mastication and deglutition are difficult and imperfect. In lesions of the *nucleus* of the hypoglossus nerve there is also a mild paresis of the orbicularis oris muscle. Intracranial lesions involving the hypoglossus and other nerve roots at the base of the brain may cause Aveli's syndrome: pharyngo-laryngeal or glosso-pharyngo-laryngeal paralysis; or may cause Schmidt's syndrome: the above and also sterno-cleido-mastoid and trapezius paralysis.	Hypoglossus Paralysis.	706
	The diaphragm is paralysed on one or both sides, causing dyspnoea on exertion and sinking in of the epigastrium on inspiration, especially on deep inspiration. The lower part of the lung is drawn upwards and atelectasis and pneumonia may occur. Besides the usual causes of compression and neuritis, this paralysis may also occur in pleurisy, peritonitis, trichinosis and in bulbar and spinal lesions. The paralysed diaphragm shows Litten's phenomenon.	Phrenic Paralysis.	707
	The supra-and infra-spinatus muscles are paralysed; so that rotation of the arm outward and raising it in abduction are impaired. Muscles involved are atrophic and ulnar side of hand is turned forwards.	Supra-Scapular Paralysis.	708
	The serratus anticus major is paralysed; so that when the scapula is raised, its lower angle approaches the vertebrae and the inner margin of the scapula does not lie close to the thorax and, on movements of the arm upwards and forwards, stands from the thorax like a wing. The arm cannot be raised beyond a horizontal line.	Long Thoracic Paralysis. Serratus Paralysis.	709

LOCAL PALSIES (Continued)

LOCAL PALSIES (Continued.)

Abstract of Symptoms	Diagnosis	
Motion of the arm inward and forward is impaired. Hand cannot be placed on opposite shoulder.	Anterior and Posterior Thoracic Paralysis.	710
Rotation of the arm inward and motion of the arm backward are impaired.	Sub-Scapular Paralysis.	171
The deltoid and teres minor are paralysed: so that the arm cannot be raised.	Axillary Paralysis.	712
The combined paralyses of the brachial plexus: Erb's and Klumpke's paralysis, are discussed under 454 and 455.		
The biceps, brachialis anticus and coraco-brachialis muscles are more or less completely paralysed; so that flexion of the arm at elbow is more or less impaired, especially in supination (very rare).	Musculo-Cutaneous Paralysis.	713
The pronators and flexors of the hands and fingers, the muscles of the ball of the thumb and the first and second lumbrical muscles are paralysed. The hand can neither be flexed nor pronated. The thumb cannot be brought across hand to touch the little finger, but remains close to the index finger (ape's hand). The first (proximal) phalanges of fingers can be flexed, but not the second and third phalanges.	Median Paralysis.	714
The interossei, the third and fourth lumbricals, and the muscles of the little finger are paralysed. The proximal phalanges cannot be flexed, the other phalanges cannot be extended and the little finger cannot be moved. The fingers cannot be spread. When muscle atrophy and contracture occur "claw hand" results.	Ulnar Paralysis.	715
The extensors and supinators of the hand and fingers, and the abductor pollicis longus, are paralysed. The thumb is adducted and can neither be abducted nor extended. Wrist-drop and slight pronation. Wrist and fingers cannot be extended completely. The wrist-drop differs from that of lead palsy (494) in that the supinator longus is paralysed. Therefore, if the forearm is held midway between supination and pronation and the elbow strongly flexed against a resistance offered, the belly of the supinator longus will not stand out firmly contracted as it will in lead paralysis and in health.	Musculo-Spiral and Radial Paralysis.	716
The extensor femoris is paralysed; so that flexion of the thigh on the body and extension of leg on thigh are impossible or difficult. Standing and walking are difficult, and ascension, jumping and running impossible.	Crural Paralysis (997).	717
The adductor muscles of thigh are paralysed; so that adduction of leg, pressing of thighs together and crossing of legs are impossible.	Obturator Paralysis.	718
The glutei muscles are paralysed; so that walking, ascending stairs, straightening up of body, abduction and rotation of thigh are impaired. Generally much muscular atrophy.	Gluteal Paralysis.	719
Foot and toes are paralysed; the leg cannot be flexed on thigh and rotation of the thigh is impaired. In cases of isolated tibialis paralysis there is absence of plantar flexion of foot, and of plantar, flexion, spreading and adduction of toes (Pes Calcaneus et Valgus). In cases of isolated peroneal paralysis there is absence of dorsal flexion and abduction of foot and its adduction impaired—absence of dorsal flexion of toes. There are foot-drop, high stepping gait and Pes equino-varus.	Sciatic Paralysis.	720
For paralysis from lesions of the cauda-equina, see 487, 858, 1096.	Cauda Equina Paralysis.	721

Chart XII d
Local Spasms

LOCAL SPASMS

637
LOCAL
SPASMS

Not forming part of a general spasm as in chorea, epilepsy and other convulsive disorders (617).

Abstract of Symptoms	Diagnosis	
The jaws are held tightly shut and the masseter and temporal muscles can be felt to be contracted (lock jaw), usually bilaterally. The spasm may be "tonic," as in tetanus (606), tetany (614), irritation of teeth (wisdom teeth) and certain unilateral lesions of the pons and medulla; or "clonic," as in chills and in rare cases of paralysis agitans and hysteria. When the pterygoid muscles alone are in spasm the mouth is held open and cannot be closed.	Trigeminal Spasm or Cramp. Trismus.	725
Spasms of one or more muscles of expression of the face, unilateral or bilateral, are relatively common, as in convulsive tic (601) and tic douloureux (602). These spasms are often a mixture of tonic and clonic contractions, the clonic predominating. They may affect all the muscles or only one, as in tonic spasm of the orbicularis palpebrarum (blepharospasm) (601, 617), or in clonic spasm of this muscle (spasmus nictitans: nictation). The platisma myoides often takes part in these spasms and very rarely the muscles of the soft palate and the internal and external ear muscles. Very rarely spasm of some of the facial muscles about the mouth constitute an occupation neurosis or cramp, as in the "Auctioneer's cramp" and "Cornet player's cramp." These facial cramps may be symptomatic directly of lesions of the cortical facial center, of the facial nerve in its course, and reflexly of the trigeminal nerve or its terminal filaments in the eye, nose, mouth or ear. There is also to be remembered the passive contracture of the degenerated muscles and the active contracture due to over-innervation of the convalescing muscles in facial paralysis. Causeless and uncontrollable laughter must also be classed among the facial spasms. This condition, similar to the allied state of causeless and uncontrollable crying, occurs especially in hysteria and in lesions of the optic thalamus.	Facial Spasm or Cramp (240, 505).	726
Spasm of the pharynx of a tonic nature preventing swallowing and of a clonic nature repeating the act of swallowing with great frequency occur. The former occurs in hydrophobia (607) and somewhat also in tetanus (606); while the latter, associated with coma, frequently occurs in mild epileptic attacks. The spasm also occurs from irritation of the pharynx in hysteria and very rarely, as one of the crises in locomotor ataxia (433). Spasm of the oesophagus is not uncommon in hysterical persons and makes the swallowing of food very difficult.	Glosso-Pharyngeal Spasm or Cramp.	727
Spasm of the muscles of the larynx (spasmus glottidis, false croup, laryngismus stridulus), causing noisy and difficult breathing, is a not uncommon and occasionally a dangerous condition. It occurs almost exclusively in children and is often associated with rickets and with digestive disorders. Occurs also in general diseases such as hydrophobia, hysteria, epilepsy, chorea, tabetic crises, etc. Sneezing (sternutatio spastica, ptarmus) and coughing, reflex acts implicating both the pneumogastric and the intercostal nerves, are often due to pathological conditions and irritation of the nervous system. Bradycardia, Cheyne-Stokes' respiration and cerebral vomiting are symptoms of irritation of the pneumogastric nucleus, but are not characteristic and are of little diagnostic value.	Pneumogastric Spasm or Cramp.	728
Spasm of the tongue is very rare, especially so the tonic form. During the attack speaking and swallowing is impossible. Very rarely a tonic spasm of the tongue occurs when the patient attempts to speak (stuttering and aphthongia). Spasm of the tongue is sometimes associated with facial spasm and with spasm of the submaxillary muscles. These spasms may be due directly to lesions of the cortical tongue center, of the hypoglossus nerve in its course, or reflexly, especially from lesions of teeth, mouth and nose.	Hypoglossus Spasm or Cramp.	729

LOCAL SPASMS (Continued)

	Abstract of Symptoms	Diagnosis	
LOCAL SPASMS (Cont'd)	Spasm of the neck muscles, especially the sterno-cleido-mastoid: caput obstipum (spastic wry neck), is sometimes congenital and is sometimes acquired in later life. In these cases the head is drawn towards the shoulder of the affected side and the chin is turned towards the other side and slightly elevated and the sterno-cleido-mastoid muscle can be felt to be firmly contracted. When the trapezius is the seat of the spasm the occiput is drawn backwards and turned towards the shoulder of the affected side and the edge of the muscle can be felt to be firmly contracted. Spasm of the muscles is sometimes tonic, sometimes clonic and often combined. The cause of these spasms is often neurotic and often rheumatic. Rarely it is some disease of the eye or of the ear (torticollis ab oculo laeso, ab aure laesa) or of the cervical vertebrae. Usually many muscles are involved, although one or two more prominently than the others.	Spinal Accessory Spasm or Cramp (601).	730
	Tonic spasm of the diaphragm, either unilateral or bilateral, occurs very rarely and produces dangerous dyspnoea. It sometimes occurs as one symptom of a general disease: tetanus, hydrophobia, hysteria, etc. Clonic contractions are common and cause hiccough (singultus), always a distressing and at times a dangerous symptom, which occurs occasionally in brain and spinal cord lesions and frequently in irritation of the penumogastric nerve, especially from the gastric mucous membrane. A similar but slower contraction of the diaphragm associated with facial spasm (opening of mouth) causes the act of yawning (oscedo, chasmus) which is sometimes frequently repreated as an aura of apoplexy or epilepsy and occurs also in hysteria, digestive disorders, drowsiness, etc.	Phrenic Spasm or Cramp.	731
	Tonic and clonic contractions of some or all of the abdominal muscles occur with extreme rarity, and are usually, if not always, hysterical.	Inter-costal Spasm. Abdominal Spasm.	732
	Tonic and clonic spasms of the muscles of the arm and shoulder or of the leg, with the exception of the secondary contractures due to lesions of the pyramidal tract and of the peripheral nerves, are very rare. They usually are due either to deficiency of water in the system, and often occur in disease in which much water is lost, as cholera, diarrhoea, etc., or to hysteria, or to rheumatic factors, or are reflex. The deformity resulting in each case can be predicted from the function of the muscle involved.	Brachial, or Lumbar, or Sciatic Plexus, Spasm or Cramp.	733

Chart XIII

Disorders of Speech and Gait

DIAGNOSTIC ANALYSIS OF SYMPTOMS

SYMPTOMS ANALYSED	CHARACTER OF DISORDER	
735 DISORDERS OF SPEECH, READING AND WRITING.	737 ANARTHRIA (283) Inability or unwillingness to speak. No disease of vocal organs or peripheral nerves. This condition may result from a complete aphonia (260) or complete aphasia (221) or complete dysarthria (284).	The diseases in which Anarthria and Dysarthria occur are set forth in Chart XIII a.
	738 DYSARTHRIA (284) Ability to express thought by speech but articulation is defective.	
	739 APHASIA (221) Articulation normal but expression of normal thought is defective.	The varieties of Aphasia and the conditions under which they occur are set forth in Chart XIII b.
736 DISORDERS OF GAIT.	740 ATAXIC	The diseases in which Disorders of Gait occur are set forth in Chart XIII c.
	741 PARALYTIC AND FLACCID	
	742 PARALYTIC AND SPASTIC	

Chart XIII a

Anarthria and Dysarthria

737 ANARTHRIA (283)	Result of disease in infancy, or congenital.	Auditory memories necessary for understanding spoken words were never acquired; hence innervation memories necessary for speech were never learned.	May make noises but cannot speal
			Can be trained to speak through sight.
	Result of disease in adult life.	Innervation memories necessary for speech have been acquired but are not available. No hysterical symptoms.	Complete absence of speech, and is impossible.
		Hysterical symptoms and etiological factors present, although not always prominent.	Will neither whisper nor speak.
			Can whisper faintly but distinctly.

738 DYSARTHRIA (284)	Congenital.	Vocal organs defective.		Words imperfectly formed, also a nasal voice. A	
	Defective Education.	Vocal organs normal.		Substitution of one letter for another. An exam speaks the vowels correctly but has difficulty	
	Paralytic.	The labials, the linguals or the vowel sounds or all of them cannot be properly pronounced. A careful examination reveals a paralysis or a paresis within the domain of the facial, the hypoglossus or the pneumogastric nerve.	No symptoms of any central disease.	Patient cannot whistle or close lips tightly.	
				Tongue is not protruded straight but deviates to p	
				Soft palate is not raised (bilateral) or not raised sy	
				Anesthesia of larynx. Paralysis of crico-thyroid n on lower level) and of thyreo-ary-epiglottis mus	
				Immobility of one or both vocal cords from paralys veric position of cords (between extreme adduct in cases of unilateral paralysis, the healthy corc paralysed cord.	
				Immobility of one or both vocal cords from paral cord or cords lie near the median line (extreme become smaller on inspiration.	
				Immobility of one or both vocal cords from para arytenoid lateralis muscles) and in some cases the and hoarse. Cords are wide open (abduction) in	
			May be symptoms of central disease.	Unilateral or bilateral paralysis of the soft palate all the laryngeal muscles and anesthesia of lary	
	Tremor and Ataxia.	Slow and clumsy.		Cerebellar gait.	Speech sounds as if a foreig
		Tremulous and slovenly, words are badly formed, letters and syllables are left out both in speaking and writing.		Evident mental deterioration.	Argyll-Robertson's phenom attacks may occur. Chi
					Alcoholic history, appearan
		Scanning speech.		Intention Tremor.	Great variety of widesprea
	Rigidity.	Monotonous speech.		Passive Tremor.	Rigidity of muscles and sli
	Spasm.	Certain letters (consonants) are spoken with difficulty and are repeated many times imperfec			
		Utterance is arrested by a spasm of one or more of the muscles concerned in speech, such as t is directed to the speech the worse it becomes. Singing is usually not at all affected.			

DIAGNOSTIC ANALYSIS OF SYMPTOMS

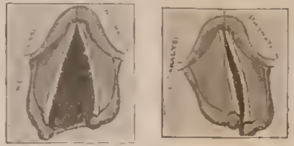
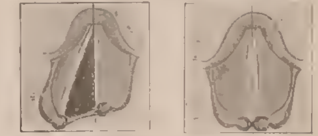
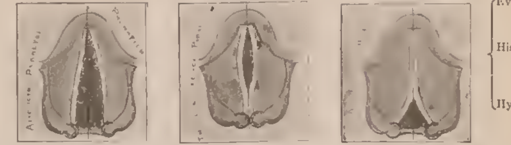
DIAGNOSTIC SYMPTOMS AND TESTS				ABSTRACT OF SYMPTOMS			DIAGNOSIS		
737 ANARTHRIA (283)	Result of disease in infancy, or congenital.	Auditory memories necessary for understanding spoken words were never acquired; hence innervation memories necessary for speech were never learned.	May make noises but cannot speak.	Expressions of face and actions are idiotic.	Reading and writing impossible.	Patient exhibits little or no intelligence and history shows that he never had any. Incapable of any but the most elementary education, if of any.	Idiocy, (1081)		743
			Can be trained to speak through the sense of sight.	Expressions of face and actions are normal.	Reading and writing are possible after much training.	Patient shows a good intelligence, but can express himself only by gestures and that only as the result of careful training. Some deaf mutes can be taught to speak, generally very imperfectly.	Deaf Mutism.		744
	Result of disease in adult life.	Innervation memories necessary for speech have been acquired but are not available. No hysterical symptoms.	Complete absence of speech, and reading aloud is impossible.	Absence of facial expression and of all voluntary actions.	Patient lies in a deep sleep and cannot be aroused to any expression of consciousness or intelligence by stimulation of any sensory surface.		Coma, (205, 1037).		745
				Facial expression and actions are abnormal.	Patient is evidently insane and has delusions. When recovery has taken place it may be learned that his silence was due to a delusion, usually either of fear or of a divine command.		Delusional Insanity, (1079)		746
		Hysterical symptoms and etiological factors present, although not always prominent.	Will neither whisper nor speak.	Hysterical appearance. Placid and contented.	Probably only a severe form of hysterical aphonia. It is a rare condition. Most cases can be persuaded to whisper a few words.		Hysterical Mutism, (1074).		747
			Can whisper faintly but distinctly.		Can, by hard urging, be made to whisper some words faintly but distinctly.		Hysterical Aphonia, (759, 1074).		748
738 DYSARTHRIA (281)	Congenital.	Vocal organs defective.		Words imperfectly formed, also a nasal voice. An examination of the vocal organs shows no paralysis, but a developmental defect; such as cleft palate and similar malformations.			Cleft Palate, etc.		749
	Defective Education.	Vocal organs normal.		Substitution of one letter for another. An examination of the vocal organs shows no defects or paralysis. Patients exhibit a rather childish or affected form of speech. Some substitute "W" for "R", others use "TH" for "S", etc. In idioglossia a child speaks the vowels correctly but has difficulty in speaking certain consonants and substitutes others for them; thus apparently invents a new language. This speech usually becomes normal as the child grows older.			Lisping and Lalling and Idioglossia.		750
	Paralytic	The labials, the linguals or the vowel sounds or all of them cannot be properly pronounced. A careful examination reveals a paralysis or a paresis within the domain of the facial, the hypoglossus or the pneumogastric nerve.	No symptoms of any central disease	Patient cannot whistle or close lips tightly.	Labials cannot be clearly spoken, especially when the paralysis is bilateral.	Other facial muscles are paralysed.	Paralysis of Facial nerve, (703, 1111 to 1117).	LOCAL PARALYSIS OF PERIPHERAL NERVES	751
				Tongue is not protruded straight but deviates to paralysed side, or cannot be protruded at all.	Linguals cannot be clearly spoken. This difficulty is usually temporary. Nasal voice. Liquids may regurgitate through nose.	May be evidence of injury or pressure upon hypoglossus nerve.	Paralysis of Hypoglossus nerve, (706).		752
				Soft palate is not raised (bilateral) or not raised symmetrically (unilateral) in phonation.	Nasal voice. Indistinct articulation, which is improved when head is thrown backwards.	May follow diphtheria. Liquids may regurgitate through nose.	Paralysis of Levator Palati.		753
				Anesthesia of larynx. Paralysis of crico-thyroid muscle (vocal cords not tense in phonation and on lower level) and of thyreo-ary-epiglottis muscle (epiglottis immobile).	Voice hoarse. In swallowing, larynx is not well closed; so that food enters it, causing cough, dyspnoea and possibly deglutition pneumonia.	May follow diphtheria.	Paralysis of Superior Laryngeal Nerve.		754
				Immobility of one or both vocal cords from paralysis of almost all the laryngeal muscles. Cadaveric position of cords (between extreme adduction and extreme abduction). In phonation, in cases of unilateral paralysis, the healthy cord moves across the median line to reach the paralysed cord.	Aphonia, weak cough and snoring breathing if bilateral. Weak, hoarse voice if unilateral. If bilateral the cords are sucked together during inspiration, giving rise to a slight stridor. 	Tumor or lesion along course of, or in, recurrent laryngeal nerve, especially lesions of the aorta or lungs.	Paralysis of the entire Recurrent Laryngeal Nerve (Recurrens Paralysis).		755
				Immobility of one or both vocal cords from paralysis of crico-arytenoid posterior muscle. The cord or cords lie near the median line (extreme adduction) leaving narrow slit which may become smaller on inspiration.	Voice very little altered. If bilateral, there is great inspiratory dyspnoea with stridor. 	May be a tumor or lesion along the recurrent nerve. May be the first symptom of an entire recurrent paralysis, or one symptom of a more general disease (bulbar paralysis, tabes, multiple sclerosis, etc.).	Paralysis of Crico-Arytenoid Posterior Nerve (Abductor or Posticus Paralysis).		756
				Immobility of one or both vocal cords from paralysis of one or both the adductors (thyro-arytenoid lateralis muscles) and in some cases the arytenoids as well. Aphonia, or voice is weak and hoarse. Cords are wide open (abduction) in all or in part of their course. Edges concave		Evidence of inflammation of the larynx.	Laryngitis.		757
						History of over use of the voice.	Exhaustion.		758
						Hysterical symptoms.	Hysterical Aphonia, (748).		759
			May be symptoms of central disease.	Unilateral or bilateral paralysis of the soft palate, of all the laryngeal muscles and anesthesia of larynx.	There are aphonia or hoarseness and nasal speech and some dysphagia. There may be respiratory dyspnoea and deglutition pneumonia. If both nerves are slightly affected there may be rapid and irregular cardiac action and slow and irregular respiration; if severely affected, death occurs.	May be evidence of injury or of pressure upon pneumogastric nerve.	Paralysis of Pneumogastric Nerve trunk, (704).		760
						Bulbar symptoms (434) with hemiplegia or paraplegia and exaggerated tendon reflexes. In pseudo-bulbar paralysis (546, 553) the speech is also thick and indistinct.	Bulbar Paralysis, (434, 544, 546, 693, 756, 1150).		761
	Tremor and Ataxia.	Slow and clumsy.	Cerebellar gait.	Speech sounds as if a foreign body was in the mouth (hot potato speech) and frequently changes in pitch. Symptoms of hereditary ataxia.			Friedreich's Hereditary Ataxia, (652, 670, 687, 781).		762
		Tremulous and slovenly, words are badly formed, letters and syllables are left out both in speaking and writing.	Evident mental deterioration.	Argyll-Robertson's phenomenon (447). History of syphilis. Lumbar puncture shows globulin and lymphocytosis. Patients are restless and especially irritable and violent, although usually amiable. Apoplectiform and epileptiform attacks may occur. Childishness and steadily progressive dementia.			Paresis, (134, 177, 579, 675, 895, 1049, 1104, 1216, 1230).		763
				Alcoholic history, appearance, tremor and breath. Temporary nature. Foolish speech and actions.			Alcoholism, (585, 658, 780, 953, 1030, 1053, 1101, 1107, 1109).		764
		Scanning speech.	Intention Tremor.	Great variety of widespread motor and sensory symptoms. Nystagmus, exaggerated knee-jerk. Babinski. The speech is jerky and somewhat resembles the scanning of verse.			Multiple or Disseminated Sclerosis, (511, 580, 659, 668, 688, 750, 799, 913, 1051).		765
	Rigidity	Monotonous speech.	Passive Tremor	Rigidity of muscles and slight flexion of most joints. Attitude is that of bending forward. Mask-like face. Festinating gait. Speech also shows festination at times.			Paralysis Agitans, (612, 677, 800).		766
	Spasm	Certain letters (consonants) are spoken with difficulty and are repeated many times imperfectly before they are finally uttered explosively. Speech is explosive and full of repetition of certain sounds.					Stammering (Anarthria Literalis).		767
		Utterance is arrested by a spasm of one or more of the muscles concerned in speech, such as the hypoglossus (aphthongia). There is difficulty in relaxing the muscle spasm so that words can be uttered. The same word is repeated several times before others can be spoken. The more the attention is directed to the speech the worse it becomes. Singing is usually not at all affected.					Stuttering (Anarthria Spasmodica or articulative tics).		768

Chart XIII b

Amnesia and Aphasia

AMNESIA AND APHASIA

	Test	Abstract of Symptoms	Diagnosis
739 AMNESIA AND APHASIA (221 to 227) None of these conditions constitutes a disease, but is rather one symptom of a more complex disease. Each is a form of dementia in the broad sense of the term and consists in a loss of general or special memories. See also Anarthria and Dysarthria (737-8).	Patient is capable of normal speech but exhibits a decided loss of memory.	The loss of memory may not be accompanied by any, or only by very little, intellectual impairment in other respects. To a certain degree the loss of memory of the names of persons is rather common and of no diagnostic or prognostic value. "Retroactive amnesia" is where events, which occurred in the more or less distant past, are referred by the memory to the immediate past, as in Korsakoff's psychosis (1100). "Retrograde amnesia" occurs in some cases of cerebral concussion and compression (1042-3), especially those associated with fright. In it, memory is lost of those events which occurred during some little time immediately previous to the injury and fright.	Amnesia. 769
		Examination of the patient shows a loss of memory, especially for recent events, impaired judgment and a general failure of mental powers. Very common in old people and in the insane, and is usually associated with mental depression.	Dementia 770 (1077).
	Patient is incapable of normal speech for want of innervation memories of spoken words	Can express ideas by gestures but cannot name objects well, or at all. Can use verbs better than nouns and proper names. Recognizes the desired word when it is spoken to him and can often then pronounce it. In speaking the patient is frequently at a loss for a word. His vocabulary is limited often to one or two words. Uses a wrong word (paraphasia, 775) but is often conscious of his mistake if his attention is called to it and often even when it is not. When his arm is not paralysed patient can usually write from copy, but makes many mistakes in spontaneous writing (paragraphia, 777). Can usually read but not aloud. The condition is usually associated with right-sided hemiplegia in right-handed persons and vice-versa.	Motor 771 Aphasia or Aphemia (221, 1390).
	Patient is incapable of normal speech for want of auditory memories of spoken words.	Patient fails to understand more or less of what is said to him. Cannot execute verbal commands but readily executes written ones. In speaking, the patient frequently uses a wrong word and is not conscious of this mistake even when his attention is called to it. Can write spontaneously and from copy but not from dictation. He can read well.	Sensory 772 Aphasia. Auditory Aphasia. Word Deafness (222, 1345).
	Patient is incapable of normal speech for want of visual memories of written or printed words.	Patient cannot name objects seen, or read written or printed letters or words. Cannot execute written commands but readily executes verbal ones. In speaking, patients rarely use a wrong word and are conscious of their mistakes. Can write from dictation imperfectly, but not at all from copy and make many mistakes in spontaneous writing. Cannot read what they have written.	Visual 773 or Optic Aphasia. Alexia. Word Blindness (223).
	Patient is incapable of normal speech from loss of innervation memories and of auditory memories of spoken words.	Patient can neither name objects nor understand words spoken to him. In speaking, patient is frequently at a loss for a word or uses a wrong one and is then unconscious of his mistake, even when attention is called to it. He may or may not be able to read and writing is impossible or very defective.	Mixed 774 Aphasia (224).
	Patient is incapable of normal speech from loss of proper associations and of appreciation of the memories concerned in speech.	Patient omits words in speaking, uses the wrong word, puts words in a wrong place in the sentence and exhibits incoherent and jargon speech.	Paraphasia 775 (225).

Text		Abstract of Symptoms	Diagnosis
Agraphia	Patient's speech is normal, but his writing is abnormal.	Patient is incapable of writing for want of the necessary innervation memories. His arm and hand are not paralysed for other movements. A very rare condition uncomplicated by motor aphasia.	Agraphia 776 (227, 1389.)
		Patient omits words in writing, uses the wrong words, mixes up words in the sentence so that writing becomes incoherent.	Paragraphia 777 (226).

Marie considers all forms of aphasia as resulting from a greater or less degree of a general intellectual impairment and not due to local cerebral lesions, especially not to those of the left inferior frontal convolution. He considers motor aphasia to be a combination of sensory aphasia with difficulty of articulation (anarthria or dysarthria). Whether he is altogether right in this or not, certainly our conceptions of aphasia previously to Marie's article had been growing too schematic. The truth probably lies somewhere between Marie's and Wernicke's ideas, neither of which is probably altogether false.

Wernicke (whose studies have contributed greatly to the comprehension of aphasia) divided motor and sensory aphasia into three sub-divisions each:

1st. Cortical Motor Aphasia in which the patient is unable to speak, write or read aloud correctly, or to speak or write correctly from dictation, or to read with full understanding, but can copy correctly and understands what is said to him.

2nd. Sub-cortical Aphasia in which the patient can neither speak spontaneously nor from dictation nor read aloud correctly, but can read, write and understand what is said to him.

3rd. Transcortical Motor Aphasia in which the patient can neither speak nor write correctly, but can speak and write from dictation, can copy, can read aloud, and can understand speech and writing.

1st. Cortical Sensory Aphasia in which the patient can speak (with paraphasia) and copy, but can neither write, nor speak, nor copy from dictation, nor read aloud perfectly, nor understand speech or writing.

2nd. Sub-cortical Sensory Aphasia in which the patient can speak, write, copy, read aloud and understand writing, but cannot speak or write from dictation, nor understand speech.

3rd. Transcortical Sensory Aphasia in which the patient can speak (with paraphasia) and write (with paragraphia), can copy, write, and speak from dictation, and read aloud, but all without understanding, and cannot understand either speech or writing.

Wernicke also recognizes a Conduction Aphasia in which the patient can speak, write and read and understand correctly, but exhibits paraphasia and paragraphia.

Chart XIII c

Disorders of Gait; Ataxic, Paralytic and Flaccid, Paralytic and Spastic Gaits

DISORDERS OF GAIT

Diagnostic Symptoms and Tests			Abstract of Symptoms			Diagnosis	
736 DISORDERS OF GAIT	740 Ataxic.	Staggering Gait.	The disorder is of a temporary nature. Patient's speech is blurred and foolish. Marked mental disorder and history of alcoholic abuse.			Alcoholic Intoxication (658, 663, 673, 764).	780
			Disease of permanent nature. Patient sways from side to side and lurches like a drunken man. The ataxia is almost entirely limited to walking and standing.	There is a strong heredity and disease occurs in family groups and in youth. Nystagmus.	Occurs before puberty. Knee-jerks usually absent. Contracture and deformity of feet.	Friedreich's or Hereditary Ataxia (652, 670, 687, 762).	781
					Occurs after puberty but in youth. Knee-jerks usually present and exaggerated. Oculo-motor paralysis and optic atrophy.	Marie's or Hereditary, Cerebellar Ataxia (651, 669).	782
				No heredity. Occurs at any age.	Retraction of head, cerebellar fits and other cerebellar symptoms may be present.	Lesions of Cerebellum or its tracts (609-10, 648, 686, 1016, 1272).	783
		Incoordinated Gait.	Patient does not walk like a drunken man, but throws his legs about in an awkward and excessive manner. All movements of legs are ataxic. In well marked cases legs are raised high, flung outwards and forwards excessively and brought back and down to ground with hard stamp on heel.	Knee-jerks abolished. Argyll-Robertson's phenomenon, optic atrophy. History of syphilis usually. A common disease.		Tabes (661, 755, 827, 894, 979, 987, 1004, 1216, 1232).	784
				Knee-jerks are usually present. May be no other symptoms than ataxia and anesthesia, or may be all the spinal symptoms of locomotor ataxia, but none of the cranial, especially no eye symptoms. A rare disease.		Lesions of posterior columns of spinal cord (654a, 1347, 1350-1, 1396.	785
	741 Paralytic and flaccid.	Waddling Gait.	In walking patient throws body from side to side like a duck. Marked lordosis. Atrophy of some muscles, apparent hypertrophy of others, but all are weak. In raising patient pushes himself up with his hands and crawls up his own legs.			Muscular dystrophies (477,1151).	786
		High Stepping Gait.	General weakness, especially of extensors. Bilateral. May be some ataxia in the walk. Muscular weakness, tenderness and atrophy. Knee-jerks absent. Many sensory symptoms.			Multiple Neuritis (488, 662, 823, 1008, 1147, 1307).	787
			Weakness of extensors only. Bilateral. Blue line on gums. Wrist-drop as well as foot-drop. History of colic and of exposure to lead.			Lead Palsy (494, 1050).	788
			Variable distribution. Weakness, especially of extensors. Often unilateral. Muscular atrophy without tenderness. Electrical reaction of degeneration. No sensory symptoms.			Acute Anterior Poliomyelitis (495, 1148, 1233).	789
		Feet drag over ground.	In walking all muscles of legs seem too weak to raise feet. No tremor or spasm. Steps short.	Temporary condition following illness. Organic and peripheral reflexes normal. No sensory paralysis.		Weakness (671).	790
				Permanent condition. Organic and peripheral reflexes disordered (lost). Sensory paralysis. Patients, even with crutches, are rarely able to walk in this disease.		Myelitis or Myelomalacia in Lumbar enlargement of cord (485, 825).	791

	Diagnostic Symptoms and Tests				Abstract of Symptoms			Diagnosis	
DISORDERS OF GAIT (Continued)	Paralytic and flaccid (Con.)	Inability to stand on one or both feet.	Hysterical symptoms present. Lack of will power.	Both legs	Legs can be moved freely and normally when lying or sitting. Patient apparently makes no effort to walk. Legs collapse. Apparently is afraid to walk or has forgotten how to walk.			Astasia and Abasia (287, 653).	792
				One leg.	The weak leg is drawn along after the strong one but never advances beyond it. In some actions when taken unawares the patient shows more strength in leg than would be necessary for walking. In walking sideways (stepping laterally) along a line patient moves badly in each direction (Schüller's side gait).			Hysterical Hemiplegia (1074).	793
	742 Paralytic and spastic	Toes scrape along ground. Legs rigid and frequently tremble.	Tendon reflexes increased. Ankle-clonus and Babinski present.	Unilateral.	The weak leg is swung forwards and outwards about the normal leg as a pivot and is set down in advance of this latter. The leg is strongly extended at the knee and the whole side of the body is rigid and swings forward as a whole. In walking sideways (stepping laterally) along a line the patient moves well towards the paralysed side, but badly towards the healthy side.			Organic Hemiplegia.	794
				Bilateral.	The legs are rigid and offer resistance to forward movements; so that body and shoulders must often be bent far backwards to pull legs forwards. Legs frequently show trembling (clonus) when brought forward. Thighs are adducted so that knees are held tight together or even crossed in walking (scissors gait).	Organic reflexes disordered, sensory symptoms. No ataxia.		Myelitis or Myelomalacia above lumbar enlargement including Compression myelitis (517-8, 829).	795
						Organic reflexes may or may not be disordered, sensory symptoms. Marked ataxia.		Ataxic Paraplegia (526, 660, 761).	796
						Organic reflexes not disordered. No sensory symptoms. No ataxia.	Adult	Spastic Paraplegia (525).	797
							Youth Scissors Gait.	Cerebral Diplegia (478, 501, 577, 1048).	798
						Intention tremor, marked ataxia,—at times staggering gait.		Disseminated or Multiple Sclerosis (511, 580, 659, 668, 688, 755, 765, 913, 1051).	799
			General rigidity.		Patient is slightly bent forwards and all his joints slightly flexed. Festination and propulsion—a tendency to go forward at ever increasing speed; also retropulsion—a tendency to stagger backwards. Passive tremor.			Paralysis Agitans (766).	800

Chart XIV
Disorders of Sensation

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DISORDERS OF GENERAL SENSATION AND OF THE SPECIAL SENSES

Symptom Analysed	Alterations in Sensation		
804 Disorders of Sensation	805 Diminution of Sensation.	810 Anesthesia and Analgesia.	See Chart XIV a.
		811 Dissociation of Sensation.	
		812 Loss of Muscle Sense.	
	806 Exaggeration of Sensation.	813 Hyperesthesia.	
	807 Disturbances of Vision.	814 Perversion.	See Chart XIV b.
		815 Limitation of field of vision.	
		816 Double vision.	See Chart XIV c.
		817 Conjugate Deviation of Eyeballs.	
		818 Pupillary Abnormalities.	See Chart XIV d.
		819 Ophthalmoscopic Examination.	
	808 Disturbances of Hearing.	820 Deafness (anakusis) and Hyperakusis.	See Chart XIV e.
	809 Disturbances of Taste and Smell.		

Chart XIVa
Disorders of Sensation

ANESTHESIA

Diagnostic Symptoms and Tests				Abstract of Symptoms		Diagnosis	
805 DIMINUTION	810 ANESTHESIA usually combined with	Tendon reflexes diminished or absent (lesion of peripheral sensory neurons) (472).	Organic reflexes normal (300).	The anesthesia corresponds to the distribution of a nerve or to that of one of its branches, though usually less extensive. In case of spinal nerves there is also a paralysis of motion, more or less pronounced, in the distribution of the nerve (Fig. 32-3).		Neuritis or Nerve Injury (489, 492, 882, 941, 1146, 1173, 1301).	S22
				Anesthesia, pain and muscular paralysis, tenderness and atrophy widespread and symmetrical in the distribution of spinal nerves. Usually a history of alcoholic abuse.		Multiple Neuritis (488, 662, 787, 823, 1008, 1147, 1307).	S23
				The anesthesia corresponds to the distribution of a nerve root, but is less extensive. Central symptoms often present (Fig. 32-3).		Lesion of Posterior Nerve Root of Spinal Segment (1302).	S24
			Organic reflexes disordered (300).	Associated with flaccid paralysis, muscular atrophy and trophic disturbances in legs. Bladder empty and dribbling. Incontinence of feces. Bedsores.	Symptoms bilateral. Acute or sub-acute.	Myelitis or Myelomalacia in Lumbar Enlargement (485, 791).	S25
					Symptoms mainly unilateral, at least at first. Very slow progressive course.	Tumor in Lumbar Enlargement (486).	S26
				No motor paralysis, but marked ataxia and loss of muscle sense. Romberg's symptom, Argyll-Robertson's pupil. Tabetic cuirass. Retardation of conduction of pain. Optic atrophy frequent. Ulnar hyperesthesia and paresthesiae.		Tabes. Locomotor Ataxia (661, 755, 784, 894, 979, 987, 1004, 1216, 1231).	S27
			Organic reflexes disordered (300).	Associated with spastic paralysis, without muscular atrophy, in arms and legs, or in legs alone. Bilateral anesthesia bounded above by a zone of hyperesthesia.	Spastic paralysis in both arms and legs. Priapism. Disturbances of respiration.	Myelitis or Myelomalacia in Upper Cervical Region (513-4).	S28
					Spastic paralysis in both legs.	Myelitis or Myelomalacia in Dorsal Region (517-8).	S29
				Associated with paralysis of cranial nerves, ataxia, symptoms unilateral at least in early stages, dysarthria and dysphagia.		Lesion in Brain Stem (535, 656).	S30
				No motor paralysis, anesthesia limited to anal and genital region and vicinity. Incontinence of urine and feces. Impotence. Reflexes in legs normal.		Lesion of conus terminalis of Spinal Cord.	S30a

Diagnostic Symptoms and Tests					Abstract of Symptoms			Diagnosis	
OF CUTANEOUS SENSATION 304	some ANALGESIA and THERMIC ANESTHESIA, especially in severe cases of the disease (348-50).	Tendon reflexes normal or exaggerated in arms and legs (lesion of central sensory neurons) (473).	Organic reflexes usually normal, very rarely disordered (300).	Associated with motor symptoms.	Symptoms bilateral and mainly irritative.		Motor spasm (retraction of neck and opisthotonus) and convulsions. Acute onset with fever. Kernig's sign. Lumbar puncture shows globulin and increase of cellular elements in cerebro-spinal fluid. Herpes facialis.	Cerebral Meningitis (508, 590, 608, 1032, 1045, 1208-9).	831
					Symptoms unilateral. Mainly paralytic.	Acute onset.	Motor paralysis, which may be temporary. Often hemianopia. Usually ataxia and loss of muscle sense. Cerebral symptoms. Post-hemiplegic motor disorders.	Cerebral Hemorrhage or Softening (503-6, 588, 1043-63).	832
						Chronic onset.	Usually motor paralysis. Convulsions, local or general. Jacksonian epilepsy (587, 605). Mental inertia and impairment. Choked disc or optic neuritis.	Cerebral Tumor (507, 578, 587, 849, 855-61, 908, 1047).	833
				Associated with hysterical symptoms (425).			Symptoms usually unilateral. Anesthesia usually in form of hemianesthesia, which may be transferred in some cases. Anesthesia often bounded by a prominent anatomical landmark. The anesthesia is usually unknown to the patient and is discovered upon physical examination. The anesthesia is not real. The patient can button clothes, etc., with anesthetic hands without looking. No evidence of any organic disease.	Hysterical Anesthesia (1074).	834
		Tendon reflexes absent in arms; exaggerated in legs. Lesion both of peripheral and of central sensory neurons.	Organic reflexes slightly disordered (300).	Associated with flaccid paralysis and muscular atrophy in arms, with spastic paralysis in legs. Bladder distended and dribbling. Constipation. Pupils unequal often.	Symptoms bilateral and acute or sub-acute.			Myelitis or Myelomalacia in Cervical Enlargement (549-50).	835
					Symptoms mainly unilateral, at least at first. Very slow progressive course.			Tumor in Cervical Enlargement (549-50).	836

Diagnostic Symptoms and Tests			Abstract of Symptoms		Diagnosis
811 ANALGESIA and THERMIC ANESTHESIA with little or no tactile ANESTHESIA (DISSOCIATION OF SENSATION) (363).	Tendon reflexes usually exaggerated in legs (473).	Organic reflexes little or not at all disordered (300).	Sensory and motor symptoms approximately coincident. Pains and paresthesiae are prominent symptoms.	Trophic disturbances and mutilations of hands.	Syringomyelia or Morvan's Disease (552, 693, 1009, 1170, 1187). 837
			Motor paralysis and hyperesthesia on one side of body, analgesia and thermic anesthesia and at times tactile anesthesia also on the other side.	Much girdle pain. Spinal epilepsy common.	Brown-Séquard's paralysis . (spinal hemorrhage, softening, tumor or injury) (442, 509, 981). 838

812

Loss of muscle sense (akinesthesia) is usually associated with ataxia and anesthesia. It occurs in multiple neuritis, locomotor ataxia, lesion of posterior columns of cord, lesion of brain stem of the posterior third of posterior limb of internal capsule, and of the parietal cortex.

806

Exaggeration of cutaneous sensibility.	Hyperesthesia and hyperalgesia are of little or no diagnostic value, with the exception of the zone of hyperesthesia, limiting above the anesthesia, in transverse myelitis or myelomalacia.

Chart XIV b

Disturbances of Vision

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DISTURBANCES OF VISION

Diagnostic Symptoms and Tests	Abstracts of Symptoms			Diagnosis	
807 DISTURBANCES OF VISION 814 PERVERSION	A yellow color of all objects seen irrespective of their true color. Xanthopsia. (yellow vision).			Jaundice or Santonin Poisoning.	842
	A red color (erythropsia) of all objects seen irrespective of their true color (red vision).			Neurasthenia and Hysteria and after cataract operations.	843
	A green color of all objects seen irrespective of their true color (green vision).			Diseases of optic nerve and retina and after cataract operations.	844
	Muscae volitantes, twisted threads and irregular spots moving about in field of vision. Seen especially when eyes are turned towards a bright light.			Neurasthenia, circulatory disturbances in brain and digestive disturbances.	845
	Flashes of light and dark spots surrounded by a bright zone (glittering scotomata), suddenly appearing and disappearing in the field of vision.			Migraine, and Aura of Epilepsy, and circulatory disturbances in brain.	846
	Achromatopsia (364) and hemichromatopsia occur in slight lesions of the geniculate bodies, of the optic fasciculus and especially of the calcarine cortex.				847
	An inversion (red having a larger field than the blue (14)) and an interlacing, of the color fields, (Dyschromatopsia).	Hysterical symptoms (425) are present.		Hysteria (1074).	848
		Choked disc and other symptoms of brain disease are present. The color field becomes normal after the increased intra-cranial pressure is relieved. (Cushing.)		Cerebral Tumor (832).	849
815 ABSENCE OR	Blindness (358, 1318). No lesion within orbit.	Bilateral	No lesion in eye. Pupillary reflexes normal. Uremic amaurosis may be in this class (edema).	Lesion or edema of both occipital lobes.	850
		Unilateral or Bilateral	No lesion in eye. Optic neuritis may be present. Pupillary reflexes absent.	Lesion of optic nerve or chiasm.	851
	Homonymous Tetartanopia or Quadrant Hemianopia.	No hemiopic pupillary reflex. No hemianesthesia, or other paralysis. May or may not be choked disc. Very rarely occurs in lesions of optic tract or optic fasciculus of opposite side.	Upper homonymous quadrant of each field of vision.	Lesion of lower lip of contralateral calcarine fissure.	852
			Lower homonymous quadrant of each field of vision.	Lesion of upper lip of contralateral calcarine fissure.	853

DISTURBANCES OF VISION (Continued)

Diagnostic Symptoms and Tests					Abstract of Symptoms	Diagnosis	
807 DISTURBANCES OF VISION	LIMITATION OF FIELD OF VISION (358 to 361)	Homonymous hemianopia (14, 360, 1321). May very rarely be bilateral, due to double lesion.	No hemianesthesia.	No hemiopic pupillary reflex (26). No other paralysis.	Sudden onset and of short duration. Often more marked in, or limited to, one eye. No other symptoms except nervousness. Circulatory disturbances.	Aura of migraine.	854
					Choked disc. Slow onset. Progressive course of the disease.	Tumor involving median surface of contralateral occipital lobe or fasciculus of Gratiolet (850, 1364).	855
					No choked disc. Rapid onset. Permanent, not progressive or rarely shows a regressive course.	Hemorrhage or softening in or near contralateral calcarine fissure or optic fasciculus of Gratiolet (1364).	856
			Hemianesthesia.		No hemiopic pupillary reflex. No choked disc. Regressive course.	Hemorrhage or softening in the posterior part of posterior limb of contralateral internal capsule.	857
			May or may not be a hemiplegia. Hemiopic pupillary reflex. Paralysis of motor oculi or abducens nerve or both.		Choked disc. Slow onset. Progressive course.	Tumor involving contralateral optic tract or geniculate bodies (1321).	858
					No choked disc. Rapid onset. Symptoms of meningitis may be present.	Neuritis or lesion of contralateral optic tract (1321).	859
		Bitemporal hemianopia (360, 1320).	Slow onset, progressive course terminating usually in complete blindness. Choked disc. Hemiopic pupillary reflex.		Bilateral.	Tumor compressing central part of optic chiasm (1320). (Enlarged pituitary.)	860
		Nasal hemianopia (360, 1320).			Unilateral.	Tumor compressing homolateral outer part of optic chiasm.	861
		Horizontal hemianopia	Occurs in lesions of the retina, or of optic nerve or chiasm, involving their upper or lower portion.				862
		Homonymous scotomata	These may occur as the result of small lesions in the geniculate bodies, in the optic fasciculus or in the neighborhood of the calcarine fissure.				863
		Concentric limitation of field of vision, even to complete blindness.		Increased tension of eyeball.	Excavation and final atrophy of optic nerve. Pupils dilated and unequal. Cupping of disc.	Glaucoma (943).	864
				No increased tension of eyeball.	On ophthalmoscopic examination the optic papilla shows atrophy.	Optic atrophy. (Tabes.) (898).	865
				Hysterical symptoms (425) are present.		Hysteria (1074).	866

Chart XIVc
Disturbances of Vision

DIAGNOSTIC ANALYSIS OF SYMPTOMS

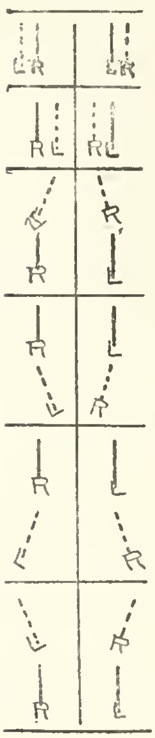
Character of the Diplopia	Secondary Deviation of Sound Eye (29)	Displacement of Visual Axis (28)	Limitation of Motion	Position of False Image (See 28)	Graphic Representation of the Diplopia. Broken Line is the False Image	Diagnosis
DISTURBANCES OF VISION 816 Double vision. Diplopia (383-4). BINOCULAR The images separate and come together again when the eyeballs are turned from one side to the other, or upward or downward and back again.	Inward.	Inward. Strabismus convergens.	Outward.	On the same side as the affected eye.		PARALYSIS OF External Rectus. 870
	Outward.	Outward. Strabismus divergens.	Inward.	On the opposite side to the affected eye.		Internal Rectus. 871
	Upward.	Downward. Strabismus deorsum vergens, slightly divergens.	Upward and somewhat inward.	Above and on opposite side to the affected eye, image tilted top inward.		Superior Rectus. 872
	Downward	Upward. Strabismus sursum vergens, slightly divergens.	Downward and somewhat inward.	Below and on opposite side to the affected eye, image tilted top outward.		Inferior Rectus. 873
	Downward and inward.	None or slightly upward and inward. Strabismus sursum vergens, slightly convergens.	Rotation downward and somewhat outward.	Below and on same side as the affected eye, image tilted top inward.		Superior Oblique. 874
	Upward and inward.	None or slightly downward and inward. Strabismus deorsum vergens, slightly convergens.	Rotation upward and somewhat outward.	Above and on same side as the affected eye, image tilted top outward.	Fig. 14	Inferior Oblique. 875
The images do not separate and come together again as eyeballs are turned.	Absent	May be variable.	The limitation of motion and the position of the false image are the reverse of those in paralysis. There may be present some irritation, especially in the nose or teeth, which would cause a reflex spasm. The spasm is usually more transient than a paralysis. The muscles usually affected are the internal rectus and the inferior oblique.			Spasm of the ocular muscles. 876
The whole eyeball can be seen to be displaced.						Displacement of eyeball. 877
Monocular No changes visible in eye.			Hysterical symptoms (425) are present.			Hysterical diplopia. 878
Changes visible in eye.			Two openings can be seen in pupil.			Double pupillary opening. 879
			By oblique illumination the lens can be seen to be opaque in patches.			Cataract. 880
			Examination shows astigmatism and an irregular contour of the cornea.			Irregularities of cornea. 881
887 Conjugate deviation of eyeballs. Associated with other symptoms of lesions in the pons. Eyes turned away from the side of the lesion. Deviation is usually not present when the eyeballs are at rest. A vertical deviation of the eyeballs occurs very rarely. It is associated with a lesion of the corpora quadrigemina. (1271).						Lesion near the anterior portion of the pons (cephalad) to the abducens nucleus. 884
Associated with other symptoms of lesions of the brain above the pons.	Eyes turned to the side of the lesion.					Paralytic lesion in almost any part of brain especially, in posterior part of frontal lobe. 885
	Eyes turned away from the side of the lesion.					Irritative lesion in cerebral cortex.

Chart XIV d

Abnormalities of Pupil and Optic Papilla

DIAGNOSTIC ANALYSIS OF SYMPTOMS
PUPILLARY ABNORMALITIES

	Diagnostic Symptoms and Tests		Abstract of Symptoms	Diagnosis	
888 PUPILLARY ABNORMALITIES	Disordered pupillary reflex to light and accommodation. Mydriasis, myosis or unequal pupils (330-1).		These phenomena occur in too many conditions to be of much diagnostic importance. Their significance has been discussed in Chart five.		
	890 The hemiopic pupillary reflex (26).	Bitemporal hemianopia (360, 1319).	Choked disc. Symptoms progressive, terminating in blindness. Often associated with acromegaly.	Tumor compressing the optic chiasm (851, 860, 1319-20).	892
		Homonymous hemianopia (360, 1321).	Often hemiplegia or paralysis of cranial nerves. Optic neuritis or symptoms of meningitis. At times a history of syphilis. Very rarely a quadrant hemianopia in partial lesions of the geniculate bodies.	Lesion of contralateral optic tract or geniculate bodies (858-9, 1321).	893
	The Argyll-Robertson's phenomenon (447).	History of syphilis. Lymphocytosis in cerebro-spinal fluid. Positive Wassermann.	Ataxia. Absence of knee-jerk. Lightning pains. Girdle sensation and tabetic cuirass.	Tabes (661, 827).	894
			Mental impairment. Blurred speech. Apraxia. Restlessness. Childishness. Uncontrollable.	Paresis (1104).	895
			Rarely occurs. No ataxia. Knee-jerks present. No mental impairment. Normal speech. No apraxia.	Syphilis (1205).	896

OPTIC NEURITIS AND ATROPHY

Diagnostic Symptoms and Tests						Abstract of Symptoms	Diagnosis	
889 RESULT OF OPHTHALMOSCOPIC EXAMINATION. ABNORMALITY OF PAPILLA	897 OPTIC NEURITIS CHOKED DISC	BILATERAL	Retinitis.	No marked symptoms of cerebral disease.	Albumen and casts in urine.	Headaches, especially in morning. Usually edema of some part of body. Dyspnoea on exertion and loss of strength.	Bright's Disease.	899
					Sugar in urine and in blood.	Progressive emaciation and loss of strength. Great thirst and polyuria. Large appetite. Dry skin.	Diabetes Mellitus (1175).	900
					Lead in urine.	Blue line on gums. History of lead colic. Wrist-drop. History of exposure to lead poison.	Lead Poisoning (494, 576, 584, 788, 988, 1050).	901
					Examination of the blood shows a condition of severe anemia.	Dyspnoea on exertion and progressive weakness. Pallor of skin and mucous membranes.	Anemia or Leukemia.	902
					Urine and blood normal.	History of syphilis. Argyll-Robertson's pupillary reflex. Lymphocytosis in cerebrospinal fluid.	Syphilis (1205).	903
			No retinitis.	Marked cerebral symptoms.		Well marked history of injury in which the nerve has been injured. Usually complicated with facial paralysis.	Injury.	904
						Increased size of head and fontanelles, and sutures open in the young.	Hydrocephalus (960).	905
						Retraction of head. Cerebro-spinal lymphocytosis. Fever.	Meningitis (590, 608).	906
					General convulsion or Jacksonian epilepsy is common. May be local paralysis. Reflexes usually increased.	May or may not be fever. At times a latent period. Primary suppuration of bones of skull or elsewhere. Optic neuritis present in about 53% of cases.	Cerebral Abscess or Sinus Thrombosis (508).	907
						No fever. Usually steady progression. Optic neuritis present in about 80% of all cases; almost invariably present in tumors in the posterior fossa. Tumors in pituitary gland, corpus callosum and in the central convolutions, especially extra-cerebral tumors, often show no optic neuritis.	Cerebral Tumor (507, 578).	908
		Unilateral.				Local inflammation can usually be made out by examining the eye and orbit.		
	898 OPTIC ATROPHY	BILATERAL	Secondary.			It may be the terminal stage of a neuritis and hence follow any of the causes of neuritis mentioned above. Traces of the active inflammation (old hemorrhages and exudates, etc.) can usually be seen.	Terminal stage of Optic Neuritis (865).	909
			Primary. No signs of a former inflammation.			Old age. Usually atheromatous arteries and high arterial tension.	Senile Optic Atrophy.	910
						Loss of knee-jerk. Myosis. Lightning pains. Bladder disturbance.	Tabes (827).	911
						Unequal pupils. Impairment of speech. Tremor. Mental impairment. Restlessness. Unreasonableness. Childishness.	Paresis (1104).	912
						Characteristic tremor or other symptoms of this disease can usually be made out on careful examination.	Disseminated Sclerosis (668).	913
		Unilateral.				Local inflammation or lesion can usually be made out on careful examination.	Disease of the eyeball and orbit.	914

Chart XIVe
Abnormalities of Hearing, Taste, and Smell

DIAGNOSTIC ANALYSIS OF SYMPTOMS

Diagnostic Symptoms and Tests						Abstract of Symptoms	Diagnosis	
808 DISORDERS OF HEARING	820 DEAFNESS ANAKUSIA (355)	WORDS AND SOUNDS	Usually unilateral. May be bilateral. A permanent .. symptom.	Bone conduction impaired.	No facial paralysis.	Severe paroxysmal vertigo and tinnitus aurium.	Ménière's or Labyrinth disease (650, 685, 918, 1019).	918
						No vertigo. May be heredity. Locomotor ataxia or disseminated sclerosis may be present.	Atrophy of auditory nerve.	919
				Bone conduction not impaired.	Associated with facial paralysis.	May be history of syphilis, symptoms of meningitis, symptoms of tumor at base, optic neuritis, etc.	Tumor or inflammation involving auditory nerve trunk.	920
						Disease of, or injury to, middle or outer ear cerumen.	Lesion of ear.	921
		SOUNDS	Usually bilateral. Very rarely unilateral, and then only a transitory symptom.			Associated with symptoms of lesion of the pons or crura cerebri.	Bilateral lesion of the lemniscus.	922
						Associated with symptoms of lesion of the cerebral cortex.	Lesion of the temporal cortex on both sides.	923
						Hysterical symptoms (425). No symptom of organic disease.	Hysterical deafness (1074).	924
		Words only.				Sensory aphasia (222) is present.	Lesion of left superior temporal convolution.	925
	821 Hyperakusia, oxyakoia or parakusia (370, 389).					Hysterical symptoms are present.	Hysteria (1074).	926
						Inflammatory lesions of ear or its neighborhood are present.	Hyperemia of inner ear.	927
						Facial paralysis is present. Low notes are especially painful. Tinnitus aurium is present.	Facial paralysis (1333–34).	928
809 Disorders of smell and taste.						Very little, if any, diagnostic significance can be attached to disturbances of smell and taste.		

Chart XV

Perversion of Sensation—Pain and Vertigo

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DISORDERS OF SENSATION—PERVERSION

SYMPTOMS ANALYSED — LOCATION OF PAIN

- 930 PERVERSION OF SENSATION IN NERVOUS DISEASES (306).
  - 931 PAIN (330).
    - 933 PAIN IN NERVE
      Pain limited to the trunk and branches of one nerve in any part of the body, except that at the height of the attack, there may be a mild radiation of the pain into corresponding nerve of opposite side or into adjacent nerves.
    - 934 PAIN IN HEAD. HEADACHES IN NERVOUS DISEASE
      After a careful examination with suitable instruments has proved the absence of glaucoma, iritis, muscular insufficiencies and other diseases of the eye, of the nose and its sinuses, of the teeth, of the ear, of the scalp (rheumatism), or of the cranial bones (periostitis, caries).
      See Chart XV a.
    - 935 PAIN IN TRUNK IN NERVOUS DISEASE
      After a careful examination has proved the absence of Pott's disease, rheumatism of spine or trunk muscles, arthritis, disease of breast, pericarditis, pleurisy, aneurism, pleurodynia, periostitis, cancer and other tumors, colic (intestinal, uterine, biliary, renal) dyspepsia, pancreatitis, appendicitis, peritonitis, gastric ulcer, gastritis, enteritis, hernia, floating kidney, tubal pregnancy, pelvic inflammation, intestinal obstruction, etc.
      See Chart XV b.
    - 936 PAIN IN EXTREMITIES IN NERVOUS DISEASE
      After a careful examination has proved the absence of any disease of the bones, muscles, joints, blood vessels or skin of the arms and legs. Flat foot must be excluded.
      See Chart XV c.
  - 932 VERTIGO
    See Chart XV d.

Chart XVa

Pain in Nerve—Pain in the Head—Headache

933 PAIN IN NERVE. The differential diagnosis between neuritis and neuralgia cannot always be made clinically. The diagnosis is aided by the experience that certain nerves, such as the sciatic, are more prone to neuritis; while others, such as the trigeminal, are more prone to neuralgia.	Paroxysmal pain with free intervals.	Never any motor paralysis or persistent anesthesia or loss of reflexes.	May be so of the h or neura
	Continuous pain with exacerbations.	May be motor paralysis or anesthesia or loss of reflexes or all combined.	May be bo disturba the elect tion. G

934 PAIN IN THE HEAD	APYREXIA	LOCALIZED PAIN	A history of neurotic heredity or other evidence of a neuropathic predisposition, congenital or acquired, is common. Pain is unilateral and is increased by movement and by exposure to cold or wind, and is sometimes associated with muscle spasm. Vasomotor and trophic disturbances are often present.	Pain limited to the whole or a portion of the trunk and distribution of the trigeminal or occipital nerves. Diseases of the eye, the nose and its sinuses, the teeth, the ear, the scalp and the bones must first be excluded. (For the diagnosis between neuritis and neuralgia see 933.)	The pain is felt above the eye in the forehead, in th If tension of eyeball be increased, examine eye for	
					The pain is felt below the eye in the cheek and side	
					The pain is felt in the lower jaw and its teeth and g	
					The pain is felt in two or three of the situations des	
					The pain is momentary in duration and is associate	
					The pain is felt in the occipital region running up alo and early symptom in neurasthenia and nervous b	
				Pain strictly limited to one-half the head.	Periodical attacks (often occuring at menstrual epoc crania angio-paralytica) or pallor and dilated pup commences in early life, ceases in old age and oft	
				Pain as if nail was being driven through the skull.	Pain of great intensity in a small spot any	
			Pain, nocturnal, in small area and spreading.	History of syphilis.	Pain may be felt at any time but is worse in evenin Cranium is often tender at points. Pain may be	
			Pain localized in small area.	Disease exists in organs within the head or body.	Frontal headache may be due to gastric dyspepsia a to pelvic disease. These referred pains are associ	
		DIFFUSE PAIN	Evidence of Poisoning.	Exogenetic.	Occurs after the ingestion of narcotics. Does not co	
					Occurs as the result of breathing for hours foul air in	
				Auto-genetic.	Occurs as the result of constipation, especially where	
					Occurs in Bright's disease, usually is worse when pa	
			Evidence of Circulatory Disorder.	Cerebral hyperemia.	Headache with fulness and throbbing in head, ag aches may be followed by a cerebral hemorrhage.	
				Cerebral anemia	Headache, most commonly at vertex, with fainting. In this as in other forms of headache several etic	
			Evidence of nervous exhaustion.	Headache associated with phobias and tremors and insomnia and other sympt pressure within the skull, especially pressure in occipital and cervical region		
			Evidence of serious brain disease.	Optic neuritis or choked disc.	Progressive symptoms, motor or sensory or both, fin cussion over the seat of the lesion. Lumbar punct	
				May follow traumatism.	Intractable, incurable more or less constant headach stretching of the dura mater by tumor, hydroceph	
			Chronic headache. Pain constant with exacerbations.	Evidences of rheumatism elsewhere.	Diffuse pain and tenderness of scalp. Pain on move	
	Pyrexia.		Evidence of infection.	Headache.	Temporary.	Occurs during the first few days o
					Permanent.	Occurs throughout the disease an
						Suppuration elsewhere in head or
	Hyperpyrexia.		Evidence of exposure to high temperature.		History of exposure to high temperature. Headach	

DIAGNOSTIC ANALYSIS OF SYMPTOMS

DIAGNOSTIC SYMPTOMS AND TESTS					ABSTRACT OF SYMPTOMS		DIAGNOSIS	
933 PAIN IN NERVAL	The differential diagnosis between neuritis and neuralgia cannot always be made clinically. The diagnosis is aided by the experience that certain nerves, such as the sciatic, are more prone to neuritis; while others, such as the trigeminal, are more prone to neuralgia.	Paroxysmal pain with free intervals	Never any motor paralysis or persistent anesthesia or loss of reflexes.	May be some vaso-motor but no trophic disturbances, except rarely a slow blanching of the hair. Never any electrical reaction of degeneration. Patient usually anemic or neurasthenic.	Certain points on the nerve are usually tender (Points of Valleix). Frequently the parts supplied by the nerve are hyperesthetic and local spasms occur. The neuralgia may be only one symptom of a more general disease (symptomatic neuralgia) or independent of any other disease (idiopathic neuralgia).		Neuralgia.	937
		Continuous pain with exacerbations	May be motor paralysis or anesthesia or loss of reflexes or all combined	May be both vaso-motor and trophic disturbances and there may also be the electrical reaction of degeneration. General health usually good.	Nerve neither swollen nor tender.	A tumor may be felt or rarely seen with X-ray on nerve.	Neuroma, (491).	938
						A tumor or a displaced bone or other substance may be felt or seen with X-ray near to and compressing the nerve.	Compression Neuritis.	939
						Rash of herpes limited to distribution of nerve.	Herpetic Neuritis.	940
					Nerve whenever it can be felt is swollen and tender. There may be an inflammatory focus near to and involving the nerve.		Neuritis, (489, 492, 882).	941
934 PAIN IN THE HEAD	APYREXIA	LOCALIZED PAIN	A history of neurotic heredity or other evidence of a neuropathic predisposition, congenital or acquired, is common. Pain is unilateral and is increased by movement and by exposure to cold or wind, and is sometimes associated with muscle spasm. Vaso-motor and trophic disturbances are often present.	Pain limited to the whole or a portion of the trunk and distribution of the trigeminal or occipital nerves. Diseases of the eye, the nose and its sinuses, the teeth, the ear, the scalp and the bones must first be excluded (For the diagnosis between neuritis and neuralgia see 933.)	The pain is felt above the eye in the forehead, in the temple and as far back as the vertex. It is most severe along the nerve trunk but extends also beyond it and on each side. The tender point is at the supra-orbital notch. The eyeball may be painful and tender. If tension of eyeball be increased, examine eye for glaucoma.		Supra-orbital Neuralgia or Neuritis.	943
					The pain is felt below the eye in the cheek and side of nose and radiates into the teeth of the upper jaw. The tender point is at the infra-orbital foramen.		Infra-orbital Neuralgia or Neuritis. 942 Trigeminal Neuralgia or Prosopalgia.	944
					The pain is felt in the lower jaw and its teeth and gums and in the side of tongue, in the ear and in the temporal region. The tender points are at the mental foramen and in the temple.		Infra-maxillary Neuralgia or Neuritis	945
					The pain is felt in two or three of the situations described above.		Trigeminal Neuralgia or Neuritis.	946
					The pain is momentary in duration and is associated with a clonic or a series of clonic spasms of a facial muscle.		Tic Douloureux	947
					The pain is felt in the occipital region running up along one side of the scalp to the vertex. The neck is stiff. The tender points are behind the mastoid process, behind the middle of the sterno-cleido-mastoid muscle and on the parietal eminence. This is a common and early symptom in neurasthenia and nervous breakdown. In many cases the pain is dull and is a sense of strong pressure rather than pain.		Occipital Neuralgia or Neuritis	948
				Pain strictly limited to one-half the head	Periodical attacks (often occurring at menstrual epoch) of severe pain, sometimes on one side, sometimes on the other side of the cranium. Skin is very hyperalgesic and vaso-motor disturbances, either in the form of flushing, sweating and contracted pupils (hemicrania angio-paralytica) or pallor and dilated pupils (hemicrania angio-spastica) are often present. Often ushered in by visual hallucinations in the form of flashes of light, etc. Towards the end of the attack there are vomiting and nausea. The disease usually commences in early life, ceases in old age and often shows a direct inheritance. "Symptomatic" migraine is not infrequent in tabes, paresis, brain tumor and epilepsy.		Migraine or Hemicrania. Idiopathic and symptomatic, (846, 854, 1028).	949
				Pain as if nail was being driven through the skull	Pain of great intensity in a small spot anywhere on scalp with the feeling as if a nail was being driven through the skull at this point. This region is tender. Hysterical symptoms (425) are present.		Clavus Hysteria, (1074).	950
			Pain, nocturnal, in small area and spreading	History of syphilis	Pain may be felt at any time but is worse in evening or night, or occurs only at night, or in the early morning hours. It follows no nerve distribution but is felt over a small area and extends over a wider and wider circle. Argyll-Robertson's phenomenon is frequent. Cranium is often tender at points. Pain may be due to periostitis. Lumbar puncture may show lymphocytosis.		Syphilitic Neuralgia.	951
			Pain localized in small area	Disease exists in organs within the head or body	Frontal headache may be due to gastric dyspepsia and constipation, as well as to disease of the eye or caries of teeth. Occipital headache and temporal headache may be due to disease of the eye, teeth, pharynx or ear. Vertex headache may be due to anemia or to pelvic disease. These referred pains are associated with hyperalgesia of skin of same region, which may be as constant and important a symptoms as is the pain. The pain of eye strain grows worse towards evening		Referred pains or Symptomatic Neuralgia, (374)	952
		DIFFUSE PAIN	Evidence of Poisoning	Exogenetic.	Occurs after the ingestion of narcotics. Does not come on immediately, often not till the next day.		Alcoholic or Morphine Headache.	953
					Occurs as the result of breathing for hours foul air in unventilated rooms, especially if patient is accustomed to pure air. Transitory.		Foul Air Headache.	954
				Auto-genetic.	Occurs as the result of constipation, especially where the bowels usually act freely.		Constipation Headache.	955
					Occurs in Bright's disease, usually is worse when patient first wakes up in the morning. Urine is usually scanty and contains albumen and casts. Edema is common.		Uremic Headache	956
			Evidence of Circulatory Disorder.	Cerebral hyperemia.	Headache with fulness and throbbing in head, aggravated by cough. The congestion may be active (after taking amyl nitrite) or passive (heart disease). Vertigo and vomiting may be present. High arterial tension. Tinnitus aurium. A series of such headaches may be followed by a cerebral hemorrhage. Headaches occurring at the time of puberty or of menstruation may well be congestive.		Congestive Headache.	957
				Cerebral anemia	Headache, most commonly at vertex, with fainting. Darkness before eyes. Cold hands and feet. Cardiac or arterial disease present. A series of such headaches may be followed by a cerebral thrombosis. The headache may be relieved by the recumbent posture. In this as in other forms of headache several etiological factors may be present.		Anemic Headache.	958
			Evidence of nervous exhaustion.		Headache associated with phobias and tremors and insomnia and other symptoms of neurasthenia. Pain grows less towards evening and is usually felt in the occiput or vertex. Feeling as if a tight band or cap was upon the head (casque neurasthenique). Often a sense of fulness and pressure within the skull, especially pressure in occipital and cervical region. Headaches resulting from overstrain (mental or physical, especially eye strain) may well be of this nature.		Neurasthenic Headache, (1072).	959
			Evidence of serious brain disease	Optic neuritis or choked disc	Progressive symptoms, motor or sensory or both, first of irritation later of paralysis. In case of abscess there may be a latent period and, in the active stage, fever. Headache is constant with intense exacerbations. In rare cases the skull may be tender on percussion over the seat of the lesion. Lumbar puncture shows greatly increased pressure of cerebro-spinal fluid. Such headaches can be relieved by the operation of "decompression."		Cerebral Tumor, or Abscess, or Hydrocephalus, (507, 508, 965).	960
				May follow traumatism.	Intractable, incurable more or less constant headaches. No cause can be assigned. May be some mental deterioration or other cerebral symptoms. No optic neuritis. Lumbar puncture will usually show lymphocytosis. Apoplectic attacks may occur. Irritation or stretching of the dura mater by tumor, hydrocephalus, etc. Fever may be present in rare sub-acute cases.		Pachymeningitis and Chronic Meningitis, (488, 590).	961
			Chronic headache Pain constant with exacerbations.	Evidences of rheumatism elsewhere.	Diffuse pain and tenderness of scalp. Pain on movement of fronto-occipital muscle. Relieved often by application of warmth. At times small tender nodules can be felt, and hence the condition has been called "indurative headache."		Rheumatism of Scalp.	962
	Pyrexia		Evidence of infection.	Headache	Temporary	Occurs during the first few days or first week of almost any fever (typhoid). Such headaches may be due to the action of the toxic substance directly upon the brain or indirectly by causing vaso-paralytic congestion.	Infection or Toxic Headache.	963
					Permanent.	Occurs throughout the disease and is associated with muscle spasm and paralysis and local edema of the scalp (sinus thrombosis). Coma. Lumbar puncture will show lymphocytosis and globulin in cerebro-spinal fluid.	Acute Meningitis and Sinus Thrombosis, (590, 1044).	964
						Suppuration elsewhere in head or body. Latent stage. Convulsions and coma	Cerebral Abscess (960).	965
	Hyperpyrexia		Evidence of exposure to high temperature.		History of exposure to high temperature. Headache often followed by coma and convulsions		Sunstroke, (589, 1068).	966

Chart XV b

Pain in Trunk

DIAGNOSTIC ANALYSIS OF SYMPTOMS

PAIN IN TRUNK

Diagnostic Symptoms and Tests					Abstract of Symptoms		Diagnosis	
395 PAIN IN TRUNK IN NERVOUS DISEASES	PAIN IN BACK.		Evidence of neurotic temperament. No evidence of organic disease	Pain and tenderness of spinous processes.	Phobias and nervous exhaustion, pain and sense of pressure most marked in cervical spine and occiput.		Neurasthenia (1072).	970
					Hysterical symptoms (425). Much tenderness of spinous processes, especially in mid-dorsal region, also ovarian tenderness is common.		Hysteria. Spinal . Neuralgia (1074).	971
				Pain and tenderness of coccyx.	Severe pain in coccyx without evidence of any disease of it. Pain increased by motion, touch, defecation, etc. In most cases there is a history of injury. Often hysterical symptoms (425) are present.		Coccygodynia.	972
			Pain, tenderness and rigidity of spine.	May follow traumatism.	Severe and constant pain in back and radiating about body and into extremities. Much spasm of spinal muscles. Exaggerated reflexes. Little or no paralysis, and if any, it is of a transitory nature. Hyperesthesia and hyperalgesia.	Injury. Very sudden onset. Lumbar puncture may show bloody fluid. Retention of urine.	Hematorrhachis (524).	973
						History of infection (septic, syphilis,etc.) Lumbar puncture shows globulin and increase of cellular elements in cerebrospinal fluid.	Meningitis Spinalis, acute (febrile) and chronic (afebrile) (608, 1005).	974
					Slowly increasing motor and sensory symptoms, irritative and paralytic (paraplegia dolorosa). When the irritative symptoms are very prominent the tumor is meningeal, when paralytic symptoms are more prominent, the tumor is in the cord. Symptoms at first usually unilateral, later bilateral. Less pain and spasm in back, more girdle pain and pain radiating into extremities than in meningitis.		Spinal Tumor (509, 826, 836, 838, 981, 1006).	975
	PAIN	GIRDLE PAIN 374	Vertebral column is ankylosed.		It may be possible to feel exostoses on vertebrae. Unilateral or bilateral girdle pains at level of the disease. Rarely any paralytic symptoms. Usually bone lesions in other parts of the body.		Spondylitis Deformans. Arthritis Deformans.	976
			Unilateral.	No other symptoms.	Pain shoots around chest following the course of an intercostal nerve, or may be limited to a small area of the nerve; pleurisy, pericarditis, pneumonia, pleurodynia, periostitis, etc., having been excluded by a careful examination.	Tender points of Valleix: one, two inches from posterior median line; another, two inches from anterior median line; and a third, in mid-axillary line. Other points on nerve may also be hyperalgesic. Pain is paroxysmal. Respiration, cough, sneezing, etc., are painful.	Intercostal Neuralgia.	977
						Rash of herpetic vesicles along course of nerve.	Herpetic Neuritis (940).	978
			Bilateral usually.	Many other symptoms.	Loss of knee-jerk. Argyll-Robertson's phenomenon. Lumbar puncture gives lymphocytosis. Ataxia. Lightning pains in legs. History of syphilitic infection.		Tabes (827).	979
					There is a zone of hyperesthesia where the girdle pain is and below a bilateral anesthesia, which may be slight and a motor paralysis, which may be severe.		Transverse Myelitis.	980

Diagnostic Symptoms and Tests				Abstract of Symptoms	Diagnosis	
IN THORAX AND ABDOMEN	LOCAL PAIN	At first unilateral and later bilateral.		Slowly increasing motor and sensory symptoms, at first irritative, later paralytic. Brown-Séquard's paralysis at first.	Spinal Tumor (975).	981
		In Mammary gland.	Hysterical symptoms.	Paroxysmal attacks of pain in one mammary gland, and at times radiating beyond the limits of the breast. No tumor or other disease of the gland can be detected. Pain is usually in the left breast.	Mastodynia.	982
		In precordia and arm.	Old age. Arterial disease.	Paroxysmal attacks of pain in precordia shooting up to left shoulder and even down left arm and at times both arms. Sense of oppression in sternal region, of suffocation and impending death. Arterial tension is usually high.	Angina-pectoris.	983
			Any age. No arterial disease.	Pain similar to the above, but no arterial disease. Neurotic individual who has an overstrained heart. At times the result of gastric indigestion, tobacco, overwork, etc.	Pseudo-angina pectoris.	984
		Along attachment of diaphragm.		Pain felt in lower anterior part of chest, also in same side of neck, most frequently on left side. Breathing, sneezing, coughing, etc., painful. Pain occurs in paroxysms. Tender points are along the attachment of the diaphragm and behind sterno-cleido-mastoid muscle. No signs of pulmonary, pleural, cardiac or other disease. An extremely rare disease.	Phrenic Neuralgia.	985
		In abdomen. In all these rare forms of neuralgia organic abdominal disease must be carefully and thoroughly excluded.		Paroxysmal attacks of pain in epigastrium often occurring at the same hour, especially in the early morning. No digestive disturbances or evidence of any disease of stomach or neighboring viscera, especially no gall stones.	Gastralgia.	986
				Similar paroxysmal attacks of severe pain, occurring irregularly at pylorus or neck of bladder or anus, associated with symptoms of tabes (661).	Tabetic crises (433, 827).	987
				Paroxysmal attacks of severe pain in abdomen occurring with some periodicity; when biliary, renal and other forms of colic, appendicitis, diverticulitis, have been excluded. Pain relieved by pressure. Blue line on edge of gums, wrist-drop, lead in urine after administration of K. I.	Enteralgia (Lead Colic, etc.).	988
				Pain in hip, groin, hypogastrium and genitals. Tender points near spine, on crest of ilium, inner part of groin, etc.	Lumbo-abdominal Neuralgia.	989
		In genitals.		Neuralgic pains and irritability in the pelvic viscera: the bladder, rectum, uterus, vagina and urethra, but these are rare and relatively unimportant conditions. Neuralgic pains at times occur during years in one testicle or one labium majus. From this point the pain may radiate.	Pelvic Neuralgia.	990

Chart XV c

Pain in Extremities

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis	
936 PAIN IN EXTREMITIES	Unilateral. Any of these forms of neuritis may be associated with, or precede, or follow a rash of herpes: herpetic neuritis.	Pain in arm.	Pain radiates along one or all of the nerves of the arm, Tender points in supra-clavicular fossa, in axilla and at head of radius. Vaso-motor disturbances. Fibrillary contractions at times occur. There is no motor paralysis; but movements of arm are impaired by the pain. Tumors at base of neck and in axilla, causing pressure on nerves, must be carefully excluded.	Cervico-Brachial Neuralgia.	995
		Pain limited to the trunk and distribution of the sciatic, anterior crural or obturator nerve.	Pain shooting along the trunk, or over small areas in the distribution, of the sciatic nerve. Little, if any, anesthesia or motor paralysis, but the pain may prevent motion. Patient holds knee of the affected side semi-flexed, leg slightly abducted, inclines his body to the opposite side and bears his weight on the healthy leg. Tender points over the sciatic notch (gluteal point), above the trochanter major (trochanteric point) and in popliteal space (popliteal point). In neuritis the nerve, wherever felt, is tender and then there may be decided muscular weakness and atrophy. Sciatica is much more frequently a neuritis than a neuralgia. A rectal examination for any possible pressure upon the nerve should always be made.	Sciatica (720).	996
			Pain along the trunk and distribution of the anterior crural nerve on the anterior surface of the thigh and inner surface of leg to the ankle. Tender points on anterior aspect of the hip joint, inner side of knee and at internal malleolus. Extensors of thigh may be paralysed and atrophied and knee-jerk lost and anesthesia may be on anterior surface of thigh and inner side of leg in neuritis. May be secondary to diabetes and injury. There may be an eruption of herpes along the course of the nerve.	Crural Neuralgia or Neuritis.	997
			Pain along inner side of thigh, along course of obturator nerve, after hernia and other diseases have been excluded. A rare form of neuralgia and is usually associated with paralysis of the adductors.	Obturator Neuralgia.	998
		Pain limited to outer surface of thigh.	Pain is associated with paresthesiae (especially numbness and tingling) and is frequently associated with, and is caused by, flat foot. The paresthesiae are more characteristic of this disease than is the pain which is often entirely absent.	Meralgia Paresthetica.	999
		Pain in a joint.	Pain in a joint, usually the knee-joint, increased on motion. The skin is much more sensitive than the articular surfaces. No evidence of any disease of the joint. Many hysterical symptoms (425).	Arthralgia or Hysterical Joint.	1000
		Pain at insertion of Achilles tendon.	Severe pain at insertion of Achilles' tendon on walking and standing. May follow gonorrhea, malaria, gout or injury.	Achillodynia.	1001
		Pain in heel.	Pain in lower surface of heel, especially when walking or standing. Some cases are cured by rheumatic medicine, others by surgical removal of the subcalcaneal bursa, or of exostoses.	Talalgia.	1002
		Pain in toe.	Pain in the metatarso-phalangeal joint, especially of the fourth toe, usually following an injury. Usually occurs in women. The joint is lowered from "breaking" of the arch transversely.	Metatarsalgia or Morton's Toe.	1003

PAIN IN EXTREMITIES (Continued)

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis
NERVOUS DISEASES	Bilateral.	With girdle pains, and lumbar puncture gives lymphocytosis.	With Romberg's symptom, Argyll-Robertson's phenomenon, ataxia, loss of knee-jerk, lightning pains over small areas in legs, superficial and deep, often followed by hyperalgesia over same area.	Tabes 1004 (661).
			With pain and rigidity in back and in extremities. Exaggerated reflexes. No ataxia. No Argyll-Robertson's phenomenon.	Spinal 1005 Meningitis (608, 974).
		With anesthesia.	Steadily progressive motor and sensory symptoms, at first mainly unilateral, later bilateral. Increased pressure of cerebro-spinal fluid. Brown-Séquard's paralysis.	Spinal 1006 Tumor (509, 826, 838, 975).
			Motor paralysis and anesthesia over whole of both legs, except in some cases the domain of the anterior crural nerves. Abolition of peripheral and organic reflexes. Muscular atrophy and trophic disturbances. Anesthesia in perineum and genitals and much pain in lower back and radiating into legs.	Lesions 1007 of Cauda Equina (487).
			Motor and sensory paralysis commencing at the distal end of extremities and extending towards body. Muscular weakness, atrophy and tenderness. The disease usually commences with pain or paresthesiae in toes and fingers and often with fever.	Multiple 1008 Neuritis (488).
		With dissociation of sensation.	Pain and paresthesiae, analgesia and thermic anesthesia without tactile anesthesia. Trophic disturbances and mutilations. Symptoms are usually limited to arms with symptoms of spastic paraplegia in legs.	Syringo- 1009 myelia (552, 693, 837, 1170, 1187, 1357–9).
		With vasomotor disturbances.	Extreme pain in soles of feet associated with redness and swelling and later with pallor, shrinking and wrinkling of the same parts. Flat foot must be excluded.	Erythro- 1010 melalgia (1198).
			Pallor and coldness of fingers and toes followed by cyanosis and congestion; so that fingers and toes become purplish and even black. In extreme cases a larger or smaller slough forms and is cast off.	Ray- 1011 naud's Disease (1195).
		With fat.	Marked increase in fat either diffuse or in separate tumors in arms and legs, but not elsewhere. There is considerable pain associated with it, and the fatty masses are tender, especially in the early stages when they are forming.	Adiposis 1012 Dolorosa (1176).

Chart XV d

Vertigo

DISORDERS OF SENSATION—PERVERSION
VERTIGO

	Diagnostic Symptoms and Tests	Abstracts of Symptoms	Diagnosis	
937 VERTIGO (392)	Motor Ataxia is present.	In these cases the vertigo is not a prominent symptom. In some cases, in consequence of the incoordination, the patient is in danger of falling and fears that he will fall and experiences some vertigo; while in other cases the vertigo may be the direct result of the lesion in the brain stem and elsewhere. The diagnosis is made from the presence of motor ataxia.	Tabes, Disseminated Sclerosis and other disease with ataxia.	1015
	Cerebellar Ataxia is present.	Any disease of cerebellum, especially tumors, may cause vertigo, which is more permanent in lesions of the vermis than in those of the hemispheres. The diagnosis is made from the absence of paralysis, the cerebellar ataxia, the headache and vomiting and, in tumors, the optic neuritis and failure of sight.	Cerebellar Disease (609-10, 648, 686, 783, 1272).	1016
	Crossed Paralysis.	Lesions of the brain stem involve the tracts from the cerebellum and cause ataxia and less frequently vertigo. The diagnosis is made by the motor or sensory paralysis or both, which occur in the form of hemiplegia with increased reflexes and also of local paralysis in the domain of the cranial nerves (crossed paralysis, etc.).	Lesions of the brain stem (460, 535-6, 656, 830, 1301-4, 1375, 1378, 1382-4, 1388, 1398).	1017
	Vertigo and movement of Head.	Cysts and tumors suspended free in the fourth ventricle cause intense dizziness only when head is moved. Except for this symptom the diagnosis is extremely difficult or impossible. The vertigo may vary greatly in intensity with the position in which the head is held. Choked disc is common.	Lesions within the fourth Ventricle.	1018
	Deafness and symptoms of aural disease.	A steady, progressive deafness of one ear associated with tinnitus in that ear, and with paroxysmal attacks of severe vertigo which may throw patient to the ground. Raising the head from the ground may cause vomiting. Attacks vary in severity. Impairment or loss of bone conduction and loss of power of hearing high notes are usually present. Vertigo is usually entirely absent between the paroxysmal attacks. Suppurative and other disease of the ear may be present, but usually are not. Disease usually ceases when the ear is completely deaf, but then may commence in the other ear. Almost any disease or functional disturbance of the ear may cause vertigo by affecting the semi-circular canals or vestibular nerve directly or indirectly (aural vertigo or vertigo ab aure laesa). It is difficult to draw the line between these cases of aural vertigo and Ménière's disease, which latter is often used to cover all these conditions. Strictly speaking, Ménière's disease applies only to cases of hemorrhage into the semi-circular canals. Inflammation of the labyrinth causing vertigo is called Voltoni's disease.	Ménière's Disease. Voltoni's Disease Aural vertigo. Vertigo ab aure laesa (650, 685, 918).	1019
	Diplopia and symptoms of ocular disease.	Double vision and weakness of ocular muscles and eye strain may cause vertigo. Occurs sometimes on railway trains. The vertigo is relieved by closing the defective eye, even when it is not caused by the diplopia alone.	Ocular vertigo. Vertigo ab oculo laeso (649).	1020

VERTIGO (Continued)

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis	
937 VERTIGO (392) (CONTINUED)	Symptoms of circulatory disturbances.	Position and moving.	When patient's head is bent down for a long time and then is suddenly raised, or when patient's body is rotated rapidly, he experiences vertigo. A blow on the head will cause vertigo, probably in consequence of vaso-motor reflex disturbance. Lying on one side of back of head or moving head quickly may cause vertigo. A similar vertigo may result from the application of a galvanic current to the head.	Acute Cerebral Anemia.	1021
		Exhaustion.	Great weakness, especially in the convalescence from disease, is a common cause both of vertigo and ataxia.	Exhaustion Vertigo.	1022
		Digestive disorders.	When, in consequence of the congestion due to digestive disorders, the portal circulation is engorged with blood, the cerebral vessels are anemic. These digestive disorders may also produce abnormal chemical substances which may produce a toxic vertigo. The diagnosis is made by the presence of the digestive disorder and by the cure of the vertigo when the indigestion is cured.	Acute Cerebral Anemia from digestive disorders, hemorrhage, etc.	1023
		Cardiac and hemic Disease.	In all forms of cardiac disease the brain may receive an insufficient and irregular supply of blood and vertigo may result. This is most frequent in aortic disease. The diagnosis is made from the presence of cardiac disease. In hemic diseases the vertigo is due rather to the altered quality than quantity of the blood supply (1029).	Chronic Cerebral Anemia from blood and cardiac diseases.	1024
		Atheromatous Arteries.	Atheromatous arteries interfere with the normal blood supply both as to amount and as to uniformity of distribution and hence may cause vertigo. This is especially common in elderly people. The diagnosis is made from the presence of atheromatous arteries with, usually, an increased arterial tension.	Chronic Cerebral Anemia from atheromatous arteries (syphilis).	1025
		Apoplexy.	Vertigo is a common initial symptom of apoplexy of all forms (cerebral hemorrhage, embolism and thrombosis, and meningeal hemorrhage) and may be the only symptom of a slight attack. Usually the sequence of other symptoms makes the diagnosis clear.	Apoplexy (504).	1026
		Epilepsy.	Vertigo may constitute the aura which may or may not be followed by a full attack. The diagnosis is made from the epileptic attacks. In some cases a severe subjective sensation of vertigo may be the equivalent of an epileptic attack. Vertigo is a not uncommon symptom in the interval between the attacks, and may continue during minutes or hours.	Epilepsy (575, 1058, 1071).	1027
		Migraine.	Vertigo may be the initial symptom or may accompany an attack of migraine. The hemicrania, the much more prominent symptom, makes the diagnosis plain.	Migraine (846, 854, 949, 1028).	1028

VERTIGO (Continued)

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis	
937 VERTIGO (392) (CONTINUED)	Toxic.		Abnormal conditions of the blood as in the early stages of the infectious diseases and in leukemia, melanemia, gout, diabetes, etc.	Toxic vertigo (1024).	1029
			Various toxic substances such as tobacco, alcohol, coffee, morphia, quinine, etc., will cause vertigo, probably by affecting the circulation of the cerebral or cerebellar cortex. The diagnosis is made by the proof of the ingestion of the substances before each attack of vertigo.	Drug Vertigo.	1030
			A disease endemic in Switzerland and occurring only in men working in hot cow stables. It consists in attacks of vertigo, with dimness of vision, ptosis, often diplopia without strabismus, and a paralysis of some function or act of the arms, simulating hysteria. Pain in back of neck. Attack lasts a few minutes.	Gerlier's Vertigo. Vertige Paralysant.	1031
	Symptoms of Cerebral disease.	Organic.	In addition to apoplexy, any irritation of the meninges (tumors, local lesions and especially inflammations and syphilitic lesions) is associated with severe vertigo, especially on change of position. Tumors may act both by irritation of the meninges and by transmitted pressure on the cerebellum, or when situated in the frontal lobe by direct irritation of the cerebro-cerebellar tract. The diagnosis is made by the numerous other symptoms of these diseases: convulsions, vomiting, slow pulse, etc., which are frequently associated with the vertigo, which is less severe in the recumbent posture.	Cerebral Meningitis and Tumor (Syphilis) (508, 536-42).	1032
		Functional.	Vertigo is a not uncommon symptom in those functional nervous diseases which are the result of psychic traumata, acute and chronic; such as neurasthenia, the traumatic neuroses and hysteria. The differential diagnosis of these diseases is made in other charts. This vertigo is never very severe and often resembles rather syncopal attacks.	Neurasthenia, Traumatic Neuroses and Hysteria (1072-5).	1033

Chart XVI
Disorders of Cerebral Activity

DIAGNOSTIC ANALYSIS OF SYMPTOMS

Symptoms Analysed	Alterations in Mentality	
1036 Disordered Mentality.	1037 Coma.	See Chart XVI a.
	1038 Pseudo-Coma.	See Chart XVI b.
	1039 Double Personality.	
	1040 Weakened Mentality.	
	1041 Insanity.	See Chart XVI c.

Chart XVI a

Coma

1037 Coma or Semi-Coma (184, 632).	History, or other evidence, of injury to head.	Convulsions rare.	Pupils usually contracted and respond feebly to light.	Patient may be completely uncon toms follow the injury immedia
			Pupils dilated, often unequal. Usually do not respond to light.	Symptoms usually immediately f symptoms. Often conjugate d
	History of a previous brain illness, of which the coma is only one symptom and often the terminal one.	Convulsions are frequently present.	The symptoms are those of a local meningitis (507, 1045) or abscess (the coma are common. There may be local symptoms, both irritati be edema of eyelids and conjunctivae, choked disc, prominence of the	
			Retraction of neck and opisthotonus. Fever, headache, delirium. Con tation followed by those of paralysis.	
			Headache, vertigo and vomiting. A recent, infected wound or other c those of a rapidly growing tumor. Choked disc occurs rather rarely	
			Headache, vertigo and vomiting. May be a history of former injury. tumors at the base are more likely to cause paralysis of one or mor	
			A motor monoplegia, anarthria, etc. (rare), hemiplegia or diplegia occu leptiform convulsions, unilateral or bilateral, are frequent. Hemiath	
			Progressive mental impairment, childishness, restlessness, amiable but syllables and letters are left out and letters doubled. Apoplectiform	
			History of lead poisoning, of lead colic, of wrist-drop, etc. Blue line o	
			Intention tremor. Scanning speech. Many motor and sensory sympt	
		No convulsions.	Headache, increasing fever, difficulty in walk and speech, tremor, incr	
	History or other evidence of poisoning.	Convulsions rare.	Patient can usually be aroused from his coma sufficiently to speak and alcoholic abuse.	
		Convulsions absent.	Pupils are contracted and do not respond to light (if opium). Patient other narcotic.	
			Patient is in a confined space or room in which there is a strong smell	
	Evidence of a cardiac inadequacy.	Often a slight spasm or rigidity during the attack.	Sudden attack of coma with pallor and weak or absent cardiac action extremities cold, restlessness, yawning. Low arterial tension, steadi	
			Sudden intermission of heart beat during a considerable fraction of a	
	Sudden attack of convulsion.	Convulsions almost always present and are usually the most striking symptom of the disease, but not so characteristic as unconsciousness, which is at times the only symptom of the attack.	The attack usually commences with a convulsion described in Chart X sometimes trivial, sometimes a deed of violence (post-epileptic insan sciousness and no convulsion and either no action or some trivial or lent" and is altogether similar to the post-epileptic insanity. These themselves. After all attacks there is amnesia. A rare form of epile unconsciousness during it and the complete or almost complete absen mild or extreme dementia, especially if the attacks are frequent and show little, or no, mental impairment.	
			The attack is altogether similar to the major attack of epilepsy, but it distended abdomen, foul smelling feces, vomiting, diarrhoea, etc., a	
	Sudden attack of unilateral paralysis. Rarely the paralysis comes on slowly; steadily increasing during hours or days, "Ingravescent apoplexy." In such cases the coma may be slight or absent.	Convulsions are rare, but both tonic and clonic spasms may occur involving one-half of the body when the lesion is cortical, or involving both sides of the body when the hemorrhage occurs in the brain stem (460) or ruptures into a ventricle.	The coma comes on instantly or in the course of a few hours. There is s in the form of hemiplegia. The bilaterally innervated muscles (upp tory, abdominal, micturition, defecation, etc.) escape the paralysis. reflexes may, during the coma, be abolished, later exaggerated (Ros pass away after several hours or days. The lower branch only of th the paralysed side. Usually there is also at first, a sensory hemipleg in which latter case the motor paralysis greatly improves or entirely in leg and finally in the arm. In case recovery does not take place in leg. Post hemiplegic motor disturbances may occur, especially toms such as aphasia may occur. A reactive inflammation about th second week. Repeated attacks at varying intervals are common.	
			After uncertain prodromata, coma and paralysis with fever appear an encephalitis superior hemorrhagica acuta) or may be in the form of	
	Albumen and casts or sugar or all three in urine.	No convulsions.	Patient emaciated. Acetone odor of breath. Pulse is small and rapid	
		Convulsions usually.	Onset usually gradual. Some edema, cyanosis, restlessness, rapid noisy albumen and casts.	
	Decided fever.	Convulsions frequently.	Occurs at the onset of acute infections, especially in children. Often a vulsions are rare, and the cause may consist in a failing circulation	
	Hyperpyrexia.		History or evidence of exposure to great heat. Absence of perspiration symptoms (paralytic) occasionally occur.	

DIAGNOSTIC ANALYSIS OF SYMPTOMS

	DIAGNOSTIC SYMPTOMS AND TESTS		ABSTRACT OF SYMPTOMS		DIAGNOSIS	
1037 Coma or Semi-Coma (184, 632)	History, or other evidence, of injury to head	Convulsions rare	Pupils usually contracted and respond feebly to light.	Patient may be completely unconscious for a short time after which he remains in a dazed condition for a time, or he may be only dazed from the start. Pallor, low blood tension, vertigo and vomiting are common symptoms. May be contusion of scalp. Symptoms follow the injury immediately. Rarely any paralysis. Often retrograde amnesia (769).	Cerebral Concussion.	1042
			Pupils dilated, often unequal. Usually do not respond to light.	Symptoms usually immediately follow the injury, but not always; there may be a "lucid interval," (especially in extra-dural hemorrhage). Coma, profound stertorous breathing, pulse slow, reflexes abolished; increased tension of cerebro-spinal fluid are the usual symptoms. Often conjugate deviation of head and eyes. Often paralysis in the form of more or less complete hemiplegia, together with Babinski reflex and some spasm. Often retrograde amnesia (769).	Cerebral Compression (contusion and hemorrhage)	1043
	History of a previous brain illness, of which the coma is only one symptom and often the terminal one	Convulsions are frequently present	The symptoms are those of a local meningitis (507, 1045) or abscess (507, 1046) with usually high fever and chills (both may be absent) occurring in a cachectic, anemic, or infected patient, especially in one with caries of bone of skull (otitis). Headache, vomiting, restlessness and delirium previous to the coma are common. There may be local symptoms, both irritative and paralytic. A very characteristic symptom is a localized edema of the scalp. In thrombosis of superior longitudinal sinus there may be nose bleed and edema at root of nose. When the cavernous sinus is involved there may be edema of eyelids and conjunctivae, choked disc, prominence of the eyeball and oculo-motor and abducens paralysis. When the transverse sinus is involved there may be edema over mastoid and palpable thrombosis of internal jugular vein.		Sinus Thrombosis, (821).	1044
			Retraction of neck and opisthotonus. Fever, headache, delirium. Convulsions and retraction of abdomen. Paralysis of cranial nerves. Kernig's reflex. Lumbar puncture and examination of the fluid, which may be cloudy, give globulin and increased cellular elements in it. Symptoms of cerebral irritation followed by those of paralysis.		Meningitis, (498, 512)	1045
			Headache, vertigo and vomiting. A recent, infected wound or other cause, or origin, for suppuration. Moderate, irregular, often absent fever. Course is progressive but may be very acute or extremely chronic and often shows a latent period. The symptoms are both local and general and resemble those of a rapidly growing tumor. Choked disc occurs rather rarely. The general symptoms are more prominent than the local. Suppuration of the middle ear and of the mastoid cells must be carefully excluded, especially in children (see 508).		Cerebral Abscess, (152, 181, 508, 578, 587, 907).	1046
			Headache, vertigo and vomiting. May be a history of former injury. No fever. Course is progressive. Mental deterioration, but local symptoms are often as prominent as the general. Convulsions, especially Jacksonian epilepsy, are common, especially when tumor is in or near the cortex, while tumors at the base are more likely to cause paralysis of one or more cranial nerves. Choked disc is very common (see 507).		Cerebral Tumor, (151, 507, 536-42, 578, 587, 843, 849, 855-6, 892, 960).	1047
			A motor monoplegia, anarthria, etc. (rare), hemiplegia or diplegia occurring congenitally, or in early infancy. Usually some arrest of development of paralysed part and of skull. Little or no muscular atrophy, and reflexes exaggerated. Ankle-clonus and Babinski. Usually some mental defect. Epileptiform convulsions, unilateral or bilateral, are frequent. Hemiathetosis and hemichorea frequently complicate the disease and contractures occur in almost every case.		Cerebral Palsy of Childhood Porencephaly, (116, 501, 577, 640, 798)	1048
			Progressive mental impairment, childishness, restlessness, amiable but irritable, steadily increasing dementia. Blurred speech. Tremor of lips, tongue and hands. Terminal dementia. Inability to repeat difficult phrases, due partly to paraphasia, partly to loss of memory. Writing imperfect words, syllables and letters are left out and letters doubled. Apoplectiform and convulsive attacks. Abnormalities of pupil. Argyll-Robertson's reflex. Lumbar puncture gives globulin and lymphocytosis of cerebro-spinal fluid. History of syphilis.		Paresis, (1104)	1049
			History of lead poisoning, of lead colic, of wrist-drop, etc. Blue line on gums. Convulsions. Lead can be found in the urine, especially after the administration of K. I.		Lead Palsy, (158, 494, 584, 788).	1050
			Intention tremor. Scanning speech. Many motor and sensory symptoms. Exaggerated reflexes. Ataxia. Nystagmus. The convulsive attacks may be epileptiform, apoplectiform or myotonic. Headache, compulsory acts and slight dementia are not uncommon symptoms.		Disseminated Sclerosis, (668).	1051
		No convulsions	Headache, increasing fever, difficulty in walk and speech, tremor, increasing drowsiness, passing into coma and death. Trypanosomes are found in blood and in cerebro-spinal fluid		Trypanosomiasis or African Lethargy.	1052
	History or other evidence of poisoning.	Convulsions rare	Patient can usually be aroused from his coma sufficiently to speak and his speech is characteristic of intoxication, being indistinct, blurred and foolish. Pupils are dilated and respond to light. Flushed face and conjunctiva and stertorous respiration. Often tremor or twitching. History or evidence of alcoholic abuse		Alcoholic Coma, (764)	1053
		Convulsions absent.	Pupils are contracted and do not respond to light (if opium). Patient is dull, drowsy, and mentally incapable. Respiration is slow and stertorous. Face is congested. Pulse is at first slow, but later, especially in fatal cases, becomes rapid. History or evidence of patient's having taken morphine or other narcotic.		Narcotism from opium, etc.	1054
			Patient is in a confined space or room in which there is a strong smell of illuminating or coal gas. He is cyanotic with rapid, irregular pulse. He often vomits and exhibits more or less tonic or clonic spasm.		Illuminating or coal gas poisoning.	1055
	Evidence of a cardiac inadequacy.	Often a slight spasm or rigidity during the attack.	Sudden attack of coma with pallor and weak or absent cardiac action of short duration. Often preceded by tinnitus aurium, dimness of vision, cold sweats, and nausea. Slight spasm or rigidity is frequent during the attack. In internal hemorrhage the onset of the coma is more gradual. Pulse is small, extremities cold, restlessness, yawning. Low arterial tension, steadily growing lower.		Syncope Internal Hemorrhage	1056
			Sudden intermission of heart beat during a considerable fraction of a minute or more with coma and slight spasm. Slow pulse, atheromatous arteries. Usually occurs in advanced age.		Stokes-Adams' Disease, (436, 582).	1057
	Sudden attack of convulsion.	Convulsions almost always present and are usually the most striking symptom of the disease, but not so characteristic as unconsciousness, which is at times the only symptom of the attack.	The attack usually commences with a convulsion described in Chart X, 575. The convulsion lasts only two or three minutes and is accompanied and followed by a coma which gradually passes into a sleep. This post-epileptic coma is sometimes absent and is sometimes replaced by unconscious action, sometimes trivial, sometimes a deed of violence (post-epileptic insanity). Such an attack of general convulsions is called "the major attack" or "le grand mal." At times such an attack follows another immediately throughout a long series (status epilepticus). At other times there is only unconsciousness and no convulsion and either no action or some trivial or foolish action. This is called "the minor attack" or "le petit mal." Sometimes the attacks occur only at night (nocturnal epilepsy). At times an attack of insanity replaces the convulsive attack and is called the "psychic equivalent" and is altogether similar to the post-epileptic insanity. These attacks may last minutes, hours, or days, and in them the patients lose their former individuality. In some of these attacks (ambulatory automatism) the patients wander about and take journeys and are lost to their friends and to themselves. After all attacks there is amnesia. A rare form of epilepsy is one in which the patient falls suddenly to the ground and gets up again immediately without any appreciable loss of consciousness (vertigo). The essential characteristic of an epileptic attack is the complete or almost complete unconsciousness during it and the complete or almost complete absence of any memory of it. In the interval between the attacks, which at times extends over months and years, the patient may be entirely normal. Frequently he is irritable and shows some mental weakness which may slowly increase to mild or extreme dementia, especially if the attacks are frequent and rest on a strong hereditary basis. This condition is not to be confounded with the transitory mental impairment due to bromide given therapeutically. On the other hand, many epileptics have attacks during many years and yet show little, or no, mental impairment.		Epilepsy, (110, 126, 430, 575, 846, 1027, 1071, 1083, 1102)	1058
			The attack is altogether similar to the major attack of epilepsy, but it does not recur. There is only one attack or a series of attacks at short intervals. It can usually be referred to an irritation of some part of the body or to some form of poisoning. It is often associated with digestive disturbances, distended abdomen, foul smelling feces, vomiting, diarrhoea, etc., and ceases when these conditions are removed. It is most common in children.		Eclampsia, (576).	1059
	Sudden attack of unilateral paralysis. Rarely the paralysis comes on slowly, steadily increasing during hours or days, "Ingravescent apoplexy." In such cases the coma may be slight or absent	Convulsions are rare, but both tonic and clonic spasms may occur involving one-half of the body when the lesion is cortical, or involving both sides of the body when the hemorrhage occurs in the brain stem (460) or ruptures into a ventricle.	The coma comes on instantly or in the course of a few hours. There is stertorous respiration and a slow full pulse. Usually paralysis in the form of hemiplegia. The bilaterally innervated muscles (upper facial, ocular, masticatory, deglutition, laryngeal, respiratory, abdominal, micturition, defecation, etc.) escape the paralysis. Babinski reflex usually present from the start. The other reflexes may, during the coma, be abolished, later exaggerated (Rosenbach's sign). Patient may die in coma or the coma may pass away after several hours or days. The lower branch only of the facial is decidedly paralysed. Tongue protruded towards the paralysed side. Usually there is also at first, a sensory hemiplegia which quickly disappears, but which may be permanent, in which latter case the motor paralysis greatly improves or entirely disappears. Improvement usually begins in the face, next in leg and finally in the arm. In case recovery does not take place flexor contractures appear in arm and extensor contractures in leg. Post hemiplegic motor disturbances may occur, especially in hand. Some mental impairment persists. Local symptoms such as aphasia may occur. A reactive inflammation about the lesion may cause an exacerbation of the symptoms in the second week. Repeated attacks at varying intervals are common.	Prodromal symptoms (headache, vertigo, etc.) common. Convulsions, especially Jacksonian epilepsy (431), at onset and later in disease. Hemiplegia disappears quickly and completely.	Pachymeningitis Interna Hemorrhagica, (502, 583)	1060
				Prodromal symptoms may or may not be present. Profound and long coma usually. High arterial tension, associated with miliary aneurisms. Permanent hemiplegia. Aged patient. Presence of interstitial nephritis.	Cerebral Hemorrhage, (146, 411-13, 503, 588, 852).	1061
				No prodromata. Youthful patient. Cardiac or pulmonary disease, sepsis or aneurism. Existence of embolism elsewhere in body. Slight or absent coma. Pulse not so slow. Hemiplegia not so permanent. Paralysis of some cortical function; aphasia, hemianopia, etc. Spasms not infrequent.	Cerebral Embolism, (505, 832).	1062
				Prodromal symptoms present. Slight or no coma. Atheromatous arteries or history of syphilis. Paralysis of some cortical function; aphasia, hemianopia, etc. A mild, transitory form, with tendency to relapses and without contracture is the so-called "lacunar hemiplegia" in which not one large, but numerous minute foci of softening occur in the cortical area involved.	Cerebral Thrombosis, (506, 832, 1207).	1063
			After uncertain prodromata, coma and paralysis with fever appear and death results in two or three weeks. The disease usually occurs in young persons and seems to be due to poisoning, especially alcoholic. Optic neuritis may be present. The paralysis may attack the eye muscles (Wernicke's polio-encephalitis superior hemorrhagica acuta) or may be in the form of a hemiplegia, partial or complete.		Acute Multiple Encephalitis, (495)	1064
	Albumen and casts or sugar or all three in urine.	No convulsions.	Patient emaciated. Acetone odor of breath. Pulse is small and rapid, skin dry. Breathing is labored and may show "air hunger." Sugar and almost always albumen and casts also in urine.		Diabetic Coma	1065
		Convulsions usually.	Onset usually gradual. Some edema, cyanosis, restlessness, rapid noisy respiration. Pulse of high tension. History usually of headache, vomiting, dyspnoea and dimness of vision. Ophthalmoscope may show albuminuric retinitis. In rare cases there may be hemiplegia or other paralysis. Urine contains albumen and casts.		Uremic Coma, (576, 581, 850, 956).	1066
	Decided fever. Hyperpyrexia	Convulsions frequently.	Occurs at the onset of acute infections, especially in children. Often associated with acute indigestion with foul smelling feces. Often history of improper food. The coma which occurs in the course of, and especially towards the end of, acute infectious fevers is probably of this nature, but in these cases convulsions are rare, and the cause may consist in a failing circulation (cerebral anemia).		Toxic or Auto-Toxic Coma, (596).	1067
			History or evidence of exposure to great heat. Absence of perspiration. The coma comes on rapidly but not instantaneously and is preceded by many prodromata; such as headache, mental confusion, marked disturbances of vision, parasthesiae, weakness, etc. Delirium is a common symptom. Local symptoms (paralytic) occasionally occur.		Sunstroke or Insolation, (589, 966).	1068

Chart XVI b

Pseudo-coma, Double Personality and Weakened Mentality

PSEUDO-COMA, DOUBLE PERSONALITY, AND WEAKENED MENTALITY

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis	
1038 Pseudo-coma.	Hysterical symptoms (425).	Convulsions and Spasms frequent.	Occurs usually in girls and women of an emotional nature. Eyelids are closed and resist attempts to open them. Coma can usually be stopped by a strong and continued pressure on ovaries. Even in the apparent coma the patient is suggestible and close observation will usually show that she is attentive to her surroundings and therefore not truly comatose. Such a condition may result from external causes, or auto-, suggestion (hypnotism, somnambulism, trance).	Hysterical Coma (1074).	1069
1039 Double Personality and Automatism (209).	Hysterical symptoms (425).	Convulsions frequent.	Patient seems at times to be in a hypnotic state, or in an allied condition from auto- or foreign suggestion, or from wilful deception, and in that state to lead a life carried on from former similar states quite distinct from the normal life. In the hypnotic or allied states from auto-suggestion, patients often act like automatons.	Hysteria (1074).	1070
	Epileptic symptoms (575).		While in an unconscious state patient often performs complicated acts and leads a life of which he later has no memory. Whether in such unconscious state he can remember what happened in previous similar states is, to say the least, doubtful. While unconscious, epileptics often perform automatic acts.	Epilepsy (1058).	1071
	Apprehension and various phobias are prominent symptoms.		The symptoms are those of a general exhaustion of the nervous system, especially of the brain, associated with an increased irritability, especially of the lower centers. It is common in men as well as in women. The patients are either entirely incapable of exertion or tire easily. Every task looms as a mountain before them; so that they are discouraged before they undertake it. Their memory and will power are both poor. They feel nervous, irritable, apprehensive and have a number of peculiar fears: phobias (235) (agoraphobia, claustrophobia, etc.). They suffer much from palpitation, vaso-motor disturbances, paresthesiae, headache, backache, neuralgias and digestive disturbances.	Neurasthenia Psychasthenia (113, 155, 161, 163, 178, 180, 671, 674, 843, 845, 959, 970, 1033).	1072
			The patient is in a condition of extreme neurasthenia and is greatly depressed by reason of an abnormal state of self consciousness in which the attention is firmly and permanently fixed upon the condition of his body or of his mind. Patient is depressed because of a delusion in regard to a supposed disease or abnormality of some part of his body, generally the viscera, which delusion has its origin in abnormal sensations. On medical examination no abnormality can be discovered adequate to justify the idea, but the false idea cannot be dispelled from the patient's mind. These false judgments are very various and are often monstrous, fantastic and impossible. At times they seem like an exaggeration of the neurasthenic phobias. The patients are anxious and apprehensive, and their attention is firmly fixed on their ills.	Hypochondriasis (216).	1073

Diagnostic Symptoms and Tests		Abstract of Symptoms	Diagnosis	
1040 WEAKENED MENTALITY. Patients appear to be intelligent, but incapable of long sustained effort, and of self-control, often foolish and unreasonable. The different diseases in in these groups merge into each other and no sharp line can be drawn between them. They all rest on a neurasthenic basis, and in all suggestion plays a great part.	Abnormal and greatly increased suggestibility is a prominent symptom. Symptoms varying, inexplicable and incredible. No certain evidence of any organic disease; although almost every disease can be more or less perfectly simulated.	The disease occurs almost exclusively in women and children and the symptoms, which may apparently affect any part of the nervous system, are probably all really cerebral and seem to be imaginary: to be the result of a false idea (delusion (215)), or of suggestions adopted by the patient as the result of impressions received from others or from some abnormal sensations within his body. The patients are usually so dominated by the desire to excite wonder and admiration that they are not very scrupulous in their means of accomplishing this. Too much reliance cannot, therefore, be placed on their statements. The reaction of the patients to external stimuli varies from day to day and is often quite abnormal in its results. The symptoms of the disease are both many and variable (425). Anesthesiae, paresthesiae, hyperesthesiae, motor paralyses, convulsions, spasms, contractures, vaso-motor and secretory disturbances occur alone or combined, transitory or permanent, producing a confused and constantly varying picture of disease, which often has as its cause a psychic trauma, either acute or chronic, or more frequently both. In addition to the chronic condition of nervousness, theatrical posing, irritability and increased suggestibility, the course of the disease is interrupted by the sudden appearance of remarkable and startling symptoms of the greatest intensity which render the patient helpless and often apparently threaten life. Some of these symptoms occur so frequently that they have been called the "stigmata of hysteria;" others occur only rarely. The most important of these acute hysterical attacks are convulsion (586), coma (1071), catalepsy (611), globus hystericus (426), emotional attacks of laughing or crying, aphonia (748, 758), mutism (744), stricture of oesophagus, torticollis and other spasms (619), hemianesthesia and its transference (425, 834), astasia, abasia (653, 792), paralysis (527), ovarian tenderness, photophobia, tremor (671), spinal irritation, clavus (950), cough, dyspnoea, palpitation, vomiting, regurgitation, anorexia and fasting, tympanites, phantom tumor, false pregnancy, peritonitis, anuria, polyuria, melanuria, hemorrhages, fever, flushing, sweating, angio-neurotic edema (1201), blindness, deafness, (924), anosmia, ageusia, concentric limitation of field of vision, somnambulism (1071), double consciousness (1039), etc.	Hysteria (111, 128, 130, 153, 179, 345, 425, 527, 586, 618, 628, 662, 674, 747-8, 758, 793, 834, 848, 866, 878, 924, 926, 950, 971, 1000, 1033, 1069-70.)	1074
	The result of an accident.	The disease occurs as the result of traumatism associated with great fright, or in some accidents from fright alone without physical injury. It very rarely occurs when a severe physical injury has been received. It is especially common in railroad accidents and in cases where pecuniary compensation may be obtained for the injury; although it occurs also in cases where there is no hope of receiving any compensation. The disease is closely allied to neurasthenia and hysteria and it may present any of the symptoms described above under hysteria. Tremor fibrillary contraction, especially after exertion, vertigo, paresthesiae, neuralgic pains, local paralyses (motor and sensory), palpitation and vaso-motor disturbances are common symptoms. Quite characteristic of the disease are insomnia, especially in the early morning hours, and a melancholic, hypochondriacal, mental state. Most, if not all, of these symptoms can be simulated, and as many of these patients are seeking damages, there is naturally more or less of conscious and unconscious simulation Simulation, however, is far from explaining the traumatic neuroses, the key to which lies rather in "suggestion" as in hysteria.	Traumatic Neuroses (156, 616, 674, 1033).	1075
	All the various forms of insanity described below exhibit, and are in part dependent upon, a weakness of the mental powers, varying in degree, but always decided.			1076

Chart XVI c

Insanity

- INSANITY
  - EXTREME DEFECT IN INTELLIGENCE
    - 1076 Amentia (211). A condition in which the mind has not developed with advancing age, due to a disease of the brain, either congenital or acquired in infancy. Besides the mental defect, these patients often present many and various physical defects and deformities such as: deformed skull, posterior hydrocephalus, high palatine arch, coarse body, deformed ears, etc. The amentia may be either general or partial, and some of its slighter degrees may be due in part to defective training.
      - Patients show little or no intelligence. Are unable
        urine and feces. About their only desire is tha
        Most of these patients exhibit frequent and violen
      - Patients can talk and are more or less cleanly in the
        They are incapable of much of any education.
        common and the sexual instinct is often strongly
      - Patients show a degree of intelligence approaching
        children develop up to a certain point, but then
        ing eyes, thick fissured tongue, and short, stubby
        tobacco. Simple infantilism is often called "at
      - Certain feeble-minded persons seem incapable of a
    - 1077 Dementia (212). A condition in which the mind has developed to a certain, even a high, degree of intelligence and then in consequence of disease of the brain (functional or organic) all mental development has not only ceased but there has been a distinct retrogression, which may go on to a complete loss of intelligence. Memory, emotions and interest are all lost. Patient becomes apathetic, reacts to no stimulation, soils himself and does not even eat.
      - Occurring in youth, at puberty or before 25 or 30 years.
        - Complete apathy, coming on more or less acutely.
          tion. Appears to be anesthetic and analgesic. T
          cases recover after several months.
        - Partial apathy. Patients are dull and stupid but co
          is an absence of emotions and of interest in anyt
          They perform frequently spontaneous impulsive
          of a phrase which they have just heard or spoken
          The varieties under this head merge into each oth
      - Occurring in adult life after 25 years.
        - History of alcoholism and usually associated with m
        - History of alcoholism extending over many years.
          amounts of alcohol. The symptoms at times resen
        - History of very numerous epileptic seizures. Grad
        - History of a previous psychosis which has gradually
          (apathetic dementia) but some cases show great r
        - History of syphilis. Lumbar puncture shows globu
          inability for continuous mental concentration, r
          at least cheerfulness in spite of the illness which
          dementia. No paralysis, but much paresis and
          tabes, more rarely with various forms of spinal sc
      - Occurring in old age.
        - Associated with physical weakness and with atheron
          events, with retention of past memories. Dread
  - 1078 Hallucinations are abundant and dominant. Hallucinatory Insanity (213). A condition in which the patient is constantly receiving false perceptions from his different senses: either visual, auditory, olfactory, gustatory, tactile or painful, or from several or all combined. Associated with this is always a certain degree of impairment of consciousness, which weakens his judgment and does not permit him to decide that these hallucinations are false.
    - Patient is overwhelmed by a large n
      intentions towards him. He does
    - History of alcoholism. Patient's h
      tinuous tremor and insomnia. D
    - Disease commences with fever, hea
  - 1079 Delusions are present and dominant. Delusional Insanity (215) A condition in which the patient has formed a false judgment about things which concern him. The basis of these false judgments are partly a congenitally defective brain and partly hallucinations. Associated with these delusions there is always present a varying degree of impairment of intelligence, which prevents the patient from recognizing the falseness of the delusion when evidence is presented to him which would be adequate for a normal man; although many of these patients in their own way reason shrewdly. These delusions lead to irrational conduct on the part of the patient which would not be irrational were the delusions true.
    - History of alcoholism. Patient has
      Some alcoholic tremor. Curable,
    - Patient has delusions upon which he
      is not built upon them. Curable
    - Patient has a number of delusions,
      systematized or nearly so but w
      are strong enough to influence his
      duct and bearing. Curable in most c
    - Patient has many delusions which a
      and are woven in with the delusion
      sions are thus systematized and so
      himself as a most remarkable pers
      delusion of persecution (every hap
  - 1080 An exaggerated emotional state is the dominant symptom. Emotional Insanity (204).
    - Exaggeration of the sometimes natural feeling of sadness or discouragement with life.
      - Patient is constantly in a depressed and painful fran
        by the patient to explain the melancholy: the co
        are very prone to suicide. Their circulation and
    - Exaggeration of the natural feeling of joyousness.
      - Patients are constantly in a joyous and excited moo
        matic and due to delusions (1111). Mania is divid
    - Alternations of mania and melancholia.
      - Alternations at long intervals of mania and melanch
      - Attacks of excitement or of depression may recur (r
        Kraepelin has incorporated all of these forms under the

DIAGNOSTIC ANALYSIS OF SYMPTOMS

	DIAGNOSTIC SYMPTOMS AND TESTS	ABSTRACTS OF SYMPTOMS		DIAGNOSIS		
EXTREME DEFECT IN INTELLIGENCE	1076 Amentia (211). A condition in which the mind has not developed with advancing age, due to a disease of the brain, either congenital or acquired in infancy. Besides the mental defect, these patients often present many and various physical defects and deformities such as: deformed skull, posterior hydrocephalus, high palatine arch, coarse body, deformed ears, etc. The amentia may be either general or partial, and some of its slighter degrees may be due in part to defective training.	Patients show little or no intelligence. Are unable to speak intelligibly, but are often noisy. Many are unable to walk. Usually soil themselves with urine and feces. About their only desire is that for food. They can do no act requiring intelligence and are incapable of sustained attention. Most of these patients exhibit frequent and violent outbreaks of anger. Many of them are undersized.	Associated with hydrocephalus. Fontanelles and sutures are unusually open and broad. Brain often shows a tuberculous sclerosis with nodules.	Hydrocephalic Idiocy.	1081 Idiocy (743)	1082
			Associated with epilepsy.	Epileptic Idiocy.		1083
			Associated with a very small skull. Brain usually weighs less than 1000 grammes, or 33 ounces.	Microcephalic Idiocy		1084
			Occurring in family groups, with blindness and optic atrophy and dark red spot in place of macula lutea.	Amaurotic Idiocy.		1085
			Associated with congenital hemiplegia or diplegia and with rigidity and convulsions (501).	Porencephalic Idiocy		1086
			Associated with no special characteristic.	Idiopathic Idiocy.		1087
		Patients can talk and are more or less cleanly in their habits. They exhibit in their acts an evident though low degree of intelligence. They are incapable of much of any education. They can form few abstract conceptions and no high moral ideas. Masturbation is common and the sexual instinct is often strongly developed.	All the classes above given under idiocy but with less extreme mental defect.	Imbecility	1088 Imbecility.	1088
			Very defective intelligence in general, but in certain directions (usually music or mathematics) may show great skill.	Idiot Savants.		1089
			Associated with destruction or atrophy of the thyroid gland. Arrest of growth. Thick, dry and scaly skin. Coarse features (1163).	Cretinism.		1090
			Associated with no special characteristics.	Idiopathic Imbecility.		1091
		Patients show a degree of intelligence approaching the normal but are evidently below the standard. They cannot be educated beyond a certain point. They are often obstinate and of violent temper upon provocation, even though in general amiable. Some children develop up to a certain point, but then stop and never advance further (infantilismus). In some cases of infantilismus, there is a defective growth of the body with a small head and a peculiar characteristic Tartar-like expression of the countenance, slanting eyes, thick fissured tongue, and short, stubby figures, and possess great faculty of imitation (Kalmuck idiots or mongolismus). This disease presents many resemblances to cretinism (1090, 1164). Infantilism may be due in some cases to poison, such as wine or tobacco. Simple infantilism is often called "ateleiosis." Infantilism with premature senility is called "progeria."		Defectives and Infantilism.	1092 The Feeble-Minded	1093
		Certain feeble-minded persons seem incapable of apprehending the simplest moral ideas, although their mental defect is not so obvious in other directions. On closer examination, however, a general mental defect becomes evident		Moral Imbecility or Habitual Criminals.		1094
	1077 Dementia (212). A condition in which the mind has developed to a certain, even a high, degree of intelligence and then in consequence of disease of the brain (functional or organic) all mental development has not only ceased but there has been a distinct retrogression, which may go on to a complete loss of intelligence. Memory, emotions and interest are all lost. Patient becomes apathetic, reacts to no stimulation, soils himself and does not even eat. Occurring in youth, at puberty or before 25 or 30 years.	Complete apathy, coming on more or less acutely. Consciousness is obscure. Patient incapable of any mental effort. Is in a dream-like state, immobile and does not appreciate what is going on about him. Will answer no questions and will respond to no stimulation. Appears to be anesthetic and analgesic. There are no hallucinations or delusions. The cutaneous reflexes are lost and the tendon reflexes are exaggerated. The course of the disease is interrupted at times by periods of excitement. More than half of such cases recover after several months.		Primary Dementia		1095
		Partial apathy. Patients are dull and stupid but consciousness is fairly clear and they appreciate what is going on about them. Hallucinations and delusions are common. There is an absence of emotions and of interest in anything. Anesthesia and analgesia. They are unwilling to perform any act and offer resistance when forced to do it (negativism). They perform frequently spontaneous impulsive silly acts. They often repeat the same act or the same words many times (stereotypy). They also often repeat the last word of a phrase which they have just heard or spoken (echolalia) or repeat obscene words (copralalia), or repeat an act (echopraxia), or remain in any given posture (catalepsy). The varieties under this head merge into each other, and all show, as prominent symptoms, impulsive ideas and acts. The prognosis is uncertain.	Simple progressive mental deterioration commencing in puberty.	Hebephrenic form.	1096 Adolescent Insanity or the so-called Dementia Precox (a term of very doubtful value).	1097
			Alternating conditions of stupor and excitement, negativism, stereotypy, echolalia with steady mental deterioration.	Catatonic form		1098
			Hallucinations and partially systematized delusions with steady mental deterioration.	Paranoid form		1099
	Occurring in adult life after 25 years.	History of alcoholism and usually associated with multiple neuritis except in very rare cases. A peculiar loss of memory with a bringing of memories of the remote past up to the immediate past (retroactive amnesia (769), failure to appreciate the relations of time and space.		Korsakow's Psychosis.		1100
		History of alcoholism extending over many years. Tremor. Dysarthria. Loss of memory and power of attention and mental power. Delusions are frequent. Normal and ethical ideas blunted. Irritable, sentimental and often very susceptible to the effects of small amounts of alcohol. The symptoms at times resemble those of paresis (1104) (pseudo-paresis), but the dementia is less pronounced, the cerebro-spinal fluid is normal and improvement follows abstinence from alcohol.		Alcoholic Dementia, (658, 1107, 1109)		1101
		History of very numerous epileptic seizures. Gradual loss of memory and mental power. Masturbation is common.		Epileptic Dementia, (575, 1058).		1102
		History of a previous psychosis which has gradually passed into a condition of apathy and more or less complete loss of intelligence. Patients may carry over into this stage some traces of the emotions and delusions of the former psychosis. They usually sit motionless (apathetic dementia) but some cases show great restlessness (agitated dementia).		Terminal or Secondary Dementia.		1103
		History of syphilis. Lumbar puncture shows globulin and lymphocytosis in cerebro-spinal fluid. Wassermann reaction is present. Argyll-Robertson's phenomenon and often unequal pupils. Tremor of lips, tongue and hands. Loss of memory, loss of self-restraint, inability for continuous mental concentration, recklessness and change in character are early symptoms. Speech blurred, slovenly and tremulous. Words, syllables and letters left out in speaking and in writing. Restless, excited and irritable with exaltation or at least cheerfulness in spite of the illness which patient rarely recognizes as existent. Grandiose delusions, silliness and inconsistency in striking contrast with inordinate pretensions. Gradually increasing physical and especially mental weakness up to complete dementia. No paralysis, but much paresis and especially apraxia (240, 282). Careless, inconsiderate, slovenly clothes, etc. Apoplectiform and epileptiform seizures are usually present in the course of disease. Incurable, but remissions. Frequently associated with tabes, more rarely with various forms of spinal sclerosis.		Paresis. General Paresis. Paralytic Dementia, (134, 177, 416, 119-20, 579, 675, 763, 805, 1019, 1215, 1230)		1104
	Occurring in old age.	Associated with physical weakness and with atheromatous arteries. The dementia varies from day to day greatly in degree and may lead the patient to do very foolish things (often erotic), while apparently sane. Depression and loss of memory, especially for recent events, with retention of past memories. Dread of impending poverty. Desire to go home, imagining himself to be in a strange place. Restless at night, associated with hallucinations and delusions. Attacks of excitement.		Senile Dementia		1105
INSANITY	1078 Hallucinations are abundant and dominant. Hallucinatory Insanity (213). A condition in which the patient is constantly receiving false perceptions from his different senses: either visual, auditory, olfactory, gustatory, tactile or painful, or from several or all combined. Associated with this is always a certain degree of impairment of consciousness, which weakens his judgment and does not permit him to decide that these hallucinations are false.	Patient is overwhelmed by a large number of hallucinations which cannot be reconciled with his previous experiences. He becomes confused, frightened and timid. Doubts his own identity and that of those about him, and especially doubts their intentions towards him. He does foolish acts which might be rational were his hallucinations true. May be the early stage of other forms of insanity.		Confusional Insanity.		1106
		History of alcoholism. Patient's hallucinations are of all kinds but are usually visual and concern snakes, spiders and other small grotesque and repulsive animals. Great fright. Violent attempt to escape from his enemies. Pronounced continuous tremor and insomnia. Disease usually lasts less than a week and usually terminates in recovery.		Delirium Tremens (1101, 1109).		1107
		Disease commences with fever, headache, dazed feeling and delirium, followed by violent excitement and violent actions. Many hallucinations. Speech is continuous, violent and incoherent. Disease usually terminates fatally in two or three weeks.		Acute Delirium or Delirium Grave.		1108
	1079 Delusions are present and dominant. Delusional Insanity (215) A condition in which the patient has formed a false judgment about things which concern him. The basis of these false judgments are partly a congenitally defective brain and partly hallucinations. Associated with these delusions there is always present a varying degree of impairment of intelligence, which prevents the patient from recognizing the falseness of the delusion when evidence is presented to him which would be adequate for a normal man; although many of these patients in their own way reason shrewdly. These delusions lead to irrational conduct on the part of the patient which would not be irrational were the delusions true	History of alcoholism. Patient has formed, on the basis of hallucinations, more or less permanent delusions, especially of jealousy and persecution. These are often so exaggerated and monstrous as to be grotesque. Patients often act violently. Some alcoholic tremor. Curable, and usually lasts less than a month after alcohol has been withheld.		Acute Alcoholic Mania. Alcoholic Hallucinosis (1101, 1107).		1109
		Patient has delusions upon which he bases his actions. These delusions are not associated with any decided emotional manifestations and are at times permanent, at times changeable; but they are not reasoned upon shrewdly and a systematic theory is not built upon them. Curable in most cases.		Simple Delusional Insanity.		1110
		Patient has a number of delusions, unsystematized or nearly so but which are strong enough to influence his conduct and bearing. Curable in most cases.	These delusions are of a pleasant exhilarating nature impelling to action, to talk and incidently to the disregard of the right of others.	Symptomatic or Delusional Mania.		1111
			These delusions are of a depressive nature and tend to inhibition of action and speech, to self-abasement and to self-destruction. The patients sometimes seem to be in actual stupor (melancholia cum stupore) or merely profoundly depressed with inhibition of all action (melancholia attonita). At times the intensity of their grief drives them to frenzy and breaks through their inhibition and impels them to deeds of violence (raptus melancholicus). Occasionally there is restlessness (melancholia agitata). All these conditions seem to be the direct result of delusions. Such patients are very prone to suicide.	Symptomatic or Delusional Melancholia.		1112
		Patient has many delusions which are often the result of hallucinations. They are fixed, permanent and are reasoned upon. Newspaper paragraphs on indifferent subjects and various circumstances in the entire life of the patient are more or less distorted and are woven in with the delusions in the attempt at an explanation of the curious things which are happening to the patient. The patients reason very clearly and if their premises are granted it is almost impossible to answer their arguments. The delusions are thus systematized and some wild theory is evolved to explain them. The most trivial happenings, even in the remote past are fitted into this system in the most surprising and ludicrous way. The general result is that the patient regards himself as a most remarkable person, because so many persons busy themselves about his affairs. In typical cases the patient evolves first a delusion of observation (all things, even the most indifferent and remote have reference to him), next a delusion of persecution (every happening is to injure him or to try his character) and finally a delusion of grandeur (he must have a great destiny when so many persons seek to injure him or to tempt him).		Paranoia		1113
	1080 An exaggerated emotional state is the dominant symptom. Emotional Insanity (204). Exaggeration of the sometimes natural feeling of sadness or discouragement with life.	Patient is constantly in a depressed and painful frame of mind for which there is no discoverable adequate cause "a cloud settles over the mind." A pessimist. No hallucinations, no delusions, except such as are secondary to the depressed frame of mind and invented by the patient to explain the melancholy: the commission of an unpardonable sin, etc. There is an inhibition of mental and physical activity. Patients withdraw themselves as much as possible from the world. They sit quiet and are pictures of woe. They are very prone to suicide. Their circulation and their bodily functions are greatly disordered. Curable. The secondary form of melancholia, due to delusions, has been described under 1112		Primary Melancholia.		1114
	Exaggeration of the natural feeling of joyousness.	Patients are constantly in a joyous and excited mood without any discoverable adequate cause. Optimistic. They have no hallucination or delusions. They are impelled to constant speech and constant activity. They are violent and dangerous. Mania is often symptomatic and due to delusions (1111). Mania is divided into a mild form (maniacal excitation) and a severe form (frenzy). Curable.		Primary Mania.		1115
	Alternations of mania and melancholia.	Alternations at long intervals of mania and melancholia with usually but not always a comparative normal period between the two. The duration and the intensity of the attacks and the duration of the interval are very varying.		Circular Insanity		1116
		Attacks of excitement or of depression may recur (recurrent insanity), or may alternate, after a longer or shorter interval (circular insanity). In some cases the excited and depressed phases are commingled, or the alternations are momentary, giving a "mixed form." Kraepelin has incorporated all of these forms under the term "maniacal depressive insanity" but the permanence of this term is doubtful. His classification involves a recasting of the nomenclature of mental diseases, and it is doubtful if the time is yet ripe for such an attempt		Maniacal Depressive Insanity.		1117

Chart XVII

Trophic and Sympathetic Disorders

DIAGNOSTIC ANALYSIS OF SYMPTOMS

TROPHIC DISORDERS—DISORDERS OF THE SYMPATHETIC SYSTEM

Symptoms Analysed	Tissues Involved	
1120 Trophic Lesions.	1122 Muscular Tissue.	See Chart XVII a.
	1123 Cutaneous and Sub-Cutaneous Tissue.	See Chart XVII b.
	1124 Fatty Tissue.	See Chart XVII c.
	1125 Bone Tissue.	
	1126 Joint Disease.	
	1127 Other Trophic Lesions.	
1121 Disorders of the Sympathetic System.	1128 Ganglionic Disorders.	See Chart XVII d.
	1129 Vaso-Motor Disorders.	

Chart XVII a

Muscular Atrophy and Hypertrophy

DIAGNOSTIC ANALYSIS OF SYMPTOMS

MUSCULAR ATROPHY

		Diagnostic Symptoms and Tests					Abstract of Symptoms	Diagnosis	
1122 MUSCULAR TISSUE	1130 ATROPHY	Atrophy is great in degree and relatively rapid in onset.	Lesions of peripheral motor neurons.	Acute and subacute course, (inflammatory lesions).	Paralysis is the primary symptom and atrophy is secondary to it.	Complete or partial electrical reaction of degeneration.	History of injury, wound, bruise or scar.	Injury of nerve (489, 822).	1146
							Limited to distribution of one nerve (simple neuritis) or many nerves, (multiple neuritis). Usually associated with sensory symptoms: pain and anesthesia, nerve and muscle tenderness.	Neuritis (488-92, 882, 940-8).	1147
							Groups of muscles attacked not corresponding to the distribution of any nerve. No sensory symptoms, except some pain at onset in back, joints and muscles. Very rarely nerve and muscle tenderness. Globulin and lymphocytosis in cerebro-spinal fluid in acute stage.	Acute anterior poliomyelitis (495, 789).	1148
				Chronic course, (degenerative lesions).	Atrophy is the primary symptom and the paralysis is secondary to, and consequent upon, it.	Diminution of the electrical excitability but no reaction of degeneration	Atrophy commences in the small muscles of hands, or muscles of shoulder girdle and extends and is associated with fibrillary contractions. Mild spastic paraplegia (525, 797) in legs.	Amyotrophic lateral sclerosis (547, 695, 797).	1149
							Atrophy affects the muscles of tongue and lips and is associated with fibrillary contractions. Mild spastic paraplegia (525, 797) in legs.	Chronic bulbar paralysis (546, 694).	1150
			Lesions in muscles.				Muscles of face (Landouzy-Dejerine type) or of shoulder girdle (Erb's juvenile type) or of legs (pseudo-hypertrophic form) are first affected. Some muscles apparently hypertrophied. Excised muscle fibers show degeneration, some atrophied, a few hypertrophied, with increase of interstitial fat. No fibrillary contractions.	Muscular dystrophies (477, 786, 1156).	1151
							Associated with chronic joint disease, especially with ankylosis. Many of these cases are neuritic, but in some no neuritis can be found.	Arthritic atrophy.	1152
		Atrophy is slight in degree and very slow of onset.	Lesion in central motor neurons.	Very slow course.	Paralysis is primary and atrophy is secondary.	The atrophy is due entirely to disuse. No electrical reaction of degeneration.	The reflexes are exaggerated. Ankle-clonus and Babinski are present when legs are affected, unless prevented by contractures.	A paralysis of long standing, especially one from infancy.	1153

MUSCULAR HYPERTROPHY

Diagnostic Symptoms and Tests				Abstract of Symptoms	Diagnosis	
1131 HYPERTROPHY	Increased strength.	No lesion	Muscular fibers normal. A true hypertrophy.	The hypertrophy is the result of much exercise.	Strong man or athlete.	1154
				The hypertrophy is due to muscle spasm, occurring at the commencement of voluntary motion. Strong heredity.	Thomsen's disease (613).	1155
	Decreased strength.	Lesion in muscles.		Calf muscles, infra-spinatus, deltoid and some other muscles appear large but are weak: a false or apparent hypertrophy. Other muscles are both weak and atrophied. No fibrillary contraction. Excised muscle fibers show degeneration, some atrophied, some hypertrophied and much interstitial fat. Slow course. All muscles are finally atrophied. Legs are early and mainly affected.	Pseudo-hypertrophic paralysis (500) and the muscular dystrophies (1151).	1156

Chart XVII b

Cutaneous and Sub-cutaneous Trophic Disorders

CUTANEOUS AND SUB-CUTANEOUS TROPHIC DISORDERS

Diagnostic Symptoms and Tests		Abstract of Symptoms		Diagnosis	
1123 CUTANEOUS AND SUB-CUTANEOUS	1132 Atrophy.	The skin is unusually smooth and thin. The fingers become pointed. The nails are excessively curved and are striated. It occurs quite frequently in nervous diseases, especially in those in which the peripheral neurons are degenerated.		Glossy Skin.	1160
		The hair falls out, either all over head, face and body (as in syphilis), or only in patches, usually on the head and face. The skin is not changed in appearance. Allied to this condition is the turning white of the hair in patches, or universally, in consequence of severe pain or psychic shock, or unknown cause (loss of hair dye).		Alopecia, (general or areata).	1161
		Atrophy of the normal pigment of the skin; so that patches of clear white appear. They are, of course, most noticeable in persons of dark complexion. The edge of the patch is more deeply pigmented than the surrounding skin. See also facial hemi-atrophy, 1179.		Vitiligo and Leucoderma.	1162
	1133 Hypertrophy.	The skin and mucous membranes everywhere appear thickened, as if infiltrated, and do not pit, or pit but slightly, on pressure. The body and features are enlarged. Nails, teeth and hair break and fall out. The movements are heavy. Voice is slow and hoarse. Response is slow and intellectuality very sluggish. The thyroid gland is atrophied, or destroyed by disease. The disease may follow removal of the thyroid gland. Arterio-sclerosis and interstitial nephritis may be present. Is more common in women than in men, and frequently occurs at the time of the climacteric. When it occurs in children they become dwarfs. The cause of the disease is the absence of the secretion of the thyroid gland and it can be cured by the administration of the thyroid gland.	Occurring in adults.	Myxedema.	1163
			Occurring in children.	Cretinism and Dwarfs (1090, 1177).	1164
		The skin is thickened, generally or locally, infiltrated, very firm and hard. The bones of the phalanges become absorbed, especially at their ends, and the fingers become much shortened and abnormally movable. The disease is more common in women than in men and seems to be allied to myxedema.		Scleroderma and Sclerodactyly.	1165
	1134 Eruptions.	Clusters of vesicles filled with clear fluid, each cluster upon a patch of reddened skin; the clusters following the course of one or two nerve roots and strictly limited to their distribution. The eruption dries up and disappears after a week or two. It is usually accompanied, preceded and followed by severe pain in the nerve, along the course of which it is situated. The pain may continue for months after the rash has disappeared.		Herpes Zoster. Herpetic Neuritis.	1166
		In some forms of nervous disease (especially in hysteria) elevated patches, white or red, appear; at times spontaneously, and always when the skin is irritated (urticaria scripta, dermographia—1200). Such patches of urticaria sometimes itch and sometimes do not.		Urticaria (1201).	1167
		Successive crops of bullae, which are at first small vesicles and increase to any size, appear on the skin and mucous membranes. Several vesicles may coalesce. There may or may not be fever. There are always some burning sensations and the pain may be intense. A very fatal disease.		Pemphigus.	1168

CUTANEOUS AND SUB-CUTANEOUS TROPHIC DISORDERS (Continued)

Diagnostic Symptoms and Tests				Abstract of Symptoms	Diagnosis	
TISSUE	1135 Ulcerations.	With much loss of tissue.	Ulcerations larger and smaller with sloughing and loss of phalanges and even whole fingers and toes. The whole process is painless and may in part be the result of traumatism.	No spastic symptoms in legs. The disturbances are limited to the area of distribution of one or more nerves. All forms of sensibility are abolished. Small tumors may occur along the nerve trunks, together with other manifestations of leprosy.	Leprous Neuritis.	1169
				Spastic symptoms in legs, when, as is usual, the trophic disturbances are limited to hands and arms. Pain and temperature sense lost with persistence of tactile sensibility usually over affected area. Kyphosis and spondylitis are common symptoms.	Syringomyelia or Morvan's disease (552, 693, 1187).	1170
			Large deep sloughing ulcers commencing with redness of the skin and occurring only in bed-ridden patients usually suffering from motor and sensory paralysis, and occurring almost always on parts subjected to much pressure (sacrum, trochanters, etc.), especially when the parts are not kept scrupulously clean.		Bed Sores. Decubitus.	1171
		With small loss of tissue.	An ulceration usually commencing on the ball of the foot, not growing larger superficially, but slowly and painlessly extending deeper until in many cases it extends quite through the foot and appears on its dorsum. Such an ulcer very rarely occurs on the hand. It usually commences as a corn which ulcerates and the pus escaping forms a sinus. Loss of knee jerk, Argyll-Robertson's pupillary reflexes and other symptoms of tabes are present in the majority of cases, while sugar is present in the urine in a small minority.		Perforating Ulcer of Tabes and (rarely) Syringomyelia and Diabetes.	1172
			Ulcerations more or less severe, the result of slight traumatism. In cases of arsenical neuritis the skin is often bronzed. Symptoms of neuritis (993) are present.		Neuritis (488-92, 882, 940-8, 1147).	1173

Chart XVII c

Trophic Disorders of Fat, Bone, and Joints

TROPHIC DISORDERS OF FAT AND BONE

Diagnostic Symptoms and Tests		Abstract of Symptoms	Diagnosis	
1124 FATTY TISSUE	1136 Atrophy.	One of the earliest symptoms of diabetes mellitus is an inability of the body to deposit fat in the tissue; although previously often an excess of fat had been deposited. Patients lose weight and if the disease is long continued become emaciated. Examination of the urine shows the constant presence of sugar. Atrophy of fat and emaciation occur in fevers and in many other conditions.	Diabetes Mellitus (900, 1172).	1175
	1137 Hypertrophy.	Large and tender deposits of fat, in lumps or in layers, widely diffused over arms and legs. Face, feet and hands not much involved. Arms and legs painful and tender. Locomotion impeded. Occurs most frequently in middle aged women (often alcoholic or syphilitic).	Adiposis Dolorosa (1012).	1176
	Failure in Development.	Many cases occur, either congenitally or acquired in early life, in which the bony framework of the body does not develop normally; so that the individuals remain throughout life of abnormally small stature. There is reason to believe that some of these cases are due to atrophy or loss of function of the thyroid, or pituitary, gland. Some of these individuals are merely small but otherwise normally formed (simple dwarfs or decidedly undersized men), while others show many physical deformities. Some cases have been described elsewhere under infantilism and mongolism (1093), cretinism (1091, 1164) and microcephaly (1084). In *Achondroplasia* (chondro-dystrophia foetalis) there is a dystrophy of the epiphyseal cartilages, in consequence of which the bones do not increase normally in length; so that dwarfism results. The head is relatively long, the bridge of the nose depressed, the arms and legs short, especially their proximal segment, the hand is short, the fingers broad, of almost equal length and divergent (trident shape), lumbar lordosis, pelvis contracted, legs often bowed or knock-kneed and joints abnormally lax. The muscles are rather unusually well developed. Adults, as well as children, not infrequently become shorter in consequence of excessive bowing of weakened long bones in the legs, as in rickets, osteitis deformans (1182), osteomalacia (1185), etc., and in consequence of curvature of the spine, as in kyphosis, etc.	Dwarfism, Microsmia, Nanosmia, Achondroplasia (1164)	1177
		In cases of extensive acute anterior poliomyelitis and of cerebral palsy of childhood occurring in infancy there is often an arrest of growth or very slow growth of the part from disuse.	Disuse from Paralysis.	1178
1125 BONE TISSUE	1138 Atrophy.	One side of the face is much smaller than the other, due to atrophy of all the tissues, even of the bones, and especially of the skin and fat. The process is usually progressive. It seems to be caused by injury, infection, or cold and in some cases is due to a trigeminal neuritis. Dryness, scaliness and loss of color of the skin are common symptoms. The process commences in the skin, of which a small area atrophies, which atrophy gradually extends laterally over the skin and inwards to the fat, muscles and even bones. The process continues until the entire half of the face is atrophied and in rare cases extends beyond the median line and even to other parts of the body. One side of the tongue is usually atrophied. Pain in the trigeminal nerve usually precedes and accompanies the atrophy.	Facial Hemiatrophy.	1179

TROPHIC DISORDERS OF BONE AND JOINTS

Diagnostic Symptoms and Tests			Abstract of Symptoms	Diagnosis	
	1139 Hypertrophy.		One side of the face is much larger than the other due to enlargement of all the tissues, especially of the bones. The process is usually progressive, and seems in some cases to be due to a periostitis.	Facial Hemihypertrophy.	1180
			The bones of the head and face are enlarged, diffusely or nodulated, and may cause pressure symptoms on the nerves running through them. Headache, neuralgia, blindness, deafness, and facial paralysis are, thus, common symptoms. Lower jaw and extremities are not enlarged. Forehead is bulging and head is often of great size.	Hyperostosis Cranii or Leontiasis Ossea.	1181
			Disease commences late in life, with slight pains, especially in legs. The bones of the body become enlarged and soft, but the lower jaw is not enlarged. The head enlarges, the legs and vertebral column become bent and bowed (spondylitis and kyphosis). The patients become shorter (even as much as a foot or more) and their walk is affected.	Osteitis Deformans. Paget's Disease.	1182
			Symmetrical enlargement of all the tissues, but especially the bones of the hands and feet; also of the lower jaw, sternum, ears, tongue, etc. It comes on gradually, patient having to get larger and larger gloves and shoes. Thorax is much enlarged and patient is "round shouldered" (kyphosis). These changes are often associated with bitemporal hemianopia, followed at times by blindness. Pain in head and joints is a common symptom. The disease is caused by hypertrophy of the pituitary body. If the disease commences in early life, before the epiphyses are joined by bone to shaft, gigantism instead of acromegaly results.	Acromegaly and Gigantism.	1183
			The hands and feet are enlarged and the fingers and toes "clubbed." The bones of the forearms are also often enlarged as can be shown by the X-ray. These symptoms are associated with chronic pulmonary disease of a septic or tuberculous nature usually. The symptoms vary greatly in degree and extent; the mildest form being "clubbed fingers."	Hypertrophic Pulmonary Osteoarthropathy.	1184
	1140 Fragility.		In some persons the bones are unusually brittle and break upon the slightest violence, even on turning the patient over in bed. Some of these cases occur in old age (senility), others occur in middle life due to softening of the bone and diminution of lime salts (osteomalacia) while others occur in children. The disease causing it having been variously named: osteogenesis imperfecta, osteopsathyrosis, etc.	Fragilitas Ossium. Osteopsathyrosis.	1185
1126 Joint disease.	Joints painless, enlarged, abnormally movable, especially hyperextension, cartilages eroded, effusion of synovial fluid, exostoses of bone. The exciting cause for these changes is often painless traumatism, at least in part.	Joint involvement not uncommon. Usually in legs.	Knee-jerks are absent. Pains in legs. Ataxia without paralysis. Bladder symptoms. Argyll-Robertson pupil reflex.	Arthropathy of Tabes (661). (Charcot's Disease.)	1186
		Joint involvement rare. Usually in arms.	Knee-jerks are exaggerated. Pains in arms. Paralysis of arms (slight). Loss of painful and thermic, with persistence of tactile, sensibility.	Syringomyelia (552, 693, 1170).	1187
1127 Other trophic lesions.	1141 Atrophy and hypertrophy.		Atrophy or hypertrophy of different organs, (mammary glands, tongue, etc.) or other parts of body (hands, fingers, etc.) are not infrequently met with and may be due to disordered nervous action, but they are of obscure significance and are without diagnostic value.	Localized Hypertrophies and Atrophies, symmetrical and asymmetrical.	1188

Chart XVII d

Ganglionic Disorders; Vaso-Motor Disorders

GANGLIONIC DISORDERS

Diagnostic Symptoms and Tests		Abstract of Symptoms	Diagnosis	
1128 GANGLIONIC DISORDERS	1142 Paralytic.	Ptosis of eyelid, although patient can raise it perfectly by an effort of will (pseudo-ptosis). Contraction of pupil (myosis) which does not dilate when shaded although it contracts briskly when eye is exposed to light and on convergence. Narrowing of palpebral fissure with retraction and lowering of eyeball (enophthalmus). Intra-ocular tension diminished. The cilio-spinal reflex (335) is abolished, flushing of skin and absence of sweat on the affected side of face and also on side of neck, or of arm and thorax above the third rib.	Paralysis of Cervical Sympathetic.	1191
	1143 Irritative.	The symptoms are exactly opposite to those of paralysis of the cervical sympathetic. Dilatation of pupil (mydriasis), exophthalmus, widening of the palpebral fissure (Stellwag's sign) and delayed descent of upper eyelid when eye is turned downward (Graefe's sign). The Boston-Kocher's sign, an amplification of Graefe's sign, may occur in this disease and in ex-ophthalmic goitre (1193).	Irritation of Cervical Sympathetic.	1192
		Exophthalmus, tachycardia, goitre, flushing, sweating, tremor, nervousness, delayed descent of upper eyelid when eye is turned downward (Graefe's sign), widening of the palpebral fissure (Stellwag's sign), thrill and systolic murmur in vessels of neck and in thyroid. The disease occurs much more frequently in women than in men and although many of its symptoms may be referred to disorder of the cervical sympathetic ganglia, yet it is really due to excessive secretion of the thyroid gland. Many of its symptoms, which are the reverse of those of myxœdema (1163), can be produced by the administration of thyroid gland, and the disease can be cured by extirpation of the thyroid.	Exophthalmic Goitre.	1193
		Paroxysmal spasm or congestion of the bronchioles, often reflex from nasal disease. Freedom from symptoms in the interval. The nervous temperament of most asthmatics together with the very rapid onset and cessation of the attack indicates that the disease may be due to a disturbance of the thoracic sympathetic. The paroxysmal attacks of dyspnoea, with the abundant dry rales and prolonged expiratory murmur make the diagnosis easy. Asthma is associated with strong contraction of the diaphragm, which may be in part voluntary, in part reflex; also is usually often associated with bronchitis.	Asthma (617).	1194

VASO-MOTOR DISORDERS

Diagnostic Symptoms and Tests		Abstract of Symptoms	Diagnosis	
1129 VASO-MOTOR DISORDERS	1144 Vascular.	Paroxysmal attacks of coldness and pallor ("dead fingers," "local syncope") and tingling of fingers or toes or tip of nose or of ears or of all together. These attacks may last a few minutes or hours and then may pass off or may be followed by an attack in which the same parts become dusky blue, or purplish black, ("local asphyxia or cyanosis") from congestion. This is associated with pain. This attack may pass off, after several hours with abundant sweating, or the parts, or a small portion of them, may become gangrenous and finally slough off. The necrosis does not usually involve the whole of the cyanotic area. The disease is usually symmetrical. It is more common in cold weather and is often brought on by putting hands in cold water or by working with hands. Hematuria and evidence of congestion of other internal organs may occur in some attacks.	Raynaud's Disease. Symmetrical Gangrene (1011)	1195
		Analogous to Raynaud's disease is gangrene of extremities occurring in many members of a family at varying ages from childhood to old age; either without the local syncope or local asphyxia, or with only slight indications of these conditions in some of the cases.	Family Gangrene.	1196
		Paroxysmal attacks of formication, tingling, numbness and other paresthesiae in fingers and hands. The attacks occur at irregular intervals and exclusively in women. They seem to be brought on by overwork and by having the hands in cold water. In some cases during the attack the skin becomes pale and blue. Similar symptoms sometimes occur in the early stages of acromegaly (1183).	Acroparesthesia	1197
		Paroxysms of severe pain in one foot, rarely in both, rarely in hands and very rarely in face, lasting a few minutes or a few hours, increased by allowing foot to hang down, or by motion of it, or by cold. The pain, except in the earliest attacks, is accompanied by redness and swelling of the whole, or part, of the sole of foot. Usually attacks men only, and is generally due to a neuritis, rarely to a simple vaso-motor neurosis. The neuritis, when present, is often associated with atheromatous arteries.	Erythromelalagia (1010).	1198
		Occurs in middle aged or elderly persons and is associated with arterial disease. A painful cramp occurs in muscles of legs after a short walk and increases so that walking becomes impossible. It passes off after a short rest to return if walking is resumed. During the attack the feet are cold and there is absent or greatly diminished pulsation in the dorsalis pedis or posterior tibial artery. Syphilis, alcohol and tobacco seem to be common causes of this condition. The disease not infrequently precedes gangrene of the feet. The arms are rarely involved.	Intermittent Limping or Claudication. Dysbasia Angio-Sclerotica (554).	1199
		In many diseases if lines or writing be traced on the skin with a sharp point, the lines will appear for a few seconds white but will soon change to lines of bright redness, which will persist for minutes or hours.	Dermographia (326, 1167).	1200
	1145 Secretory.	Paroxysmal attacks of localized edema of sub-cutaneous or sub-mucous tissue, causing localized swellings, either white or red, lasting a few hours or days. The extent of the edema varies greatly. It may be one-half inch in diameter or may extend over an entire extremity. It may cause death when occurring in the larynx. These swellings are not tender and do not pit on pressure. If the swellings are red in color, itch and are associated with symptoms of digestive disorder, they are called (urticaria). No sharp line can be drawn between the two diseases except the itching.	Angio-Neurotic, Edema and Urticaria. (1167) Quincke's Disease.	1201
		Some cases present paroxysmally or constantly a profuse sweating, usually localized, sometimes general.	Hyperidrosis Excessive Sweating.	1202

Chart XVIII

Syphilis of the Nervous System

SYPHILIS OF THE NERVOUS SYSTEM

Diagnostic Symptoms and Tests				Abstract of Symptoms		Diagnosis
1205 SYPHILIS OF THE NERVOUS SYSTEM. History of personal or hereditary syphilis. Physical evidence of syphilis such as; Wassermann reaction, a chancre or its scar, or induration, mucous patches, a syphilitic	Syphilitic Nervous Diseases. Symptoms of syphilis of the nervous system are very variable from day to day, transitory and manifold. They consist of paresis rather than of complete paralysis. They usually show rapid improvement	Cerebral symptoms Although these symptoms can be divided into several, more or less well defined groups, yet a combination of several or all of the lesions in varying intensity is not infrequent; so that a combination of the symptoms of several or all of the groups may be present in one case. Pure uncomplicated cases of each type are, however, commonly met with.	Little or no lymphocytosis in cerebro-spinal fluid from lumbar puncture.	Symptoms of cerebral tumor (507, 536). Other syphilitic symptoms may be present. Rapid course with irregular remissions and intermissions. The symptoms of cerebral compression are much less pronounced than in non-syphilitic tumors. Very amenable to anti-syphilitic treatment.		Isolated Cerebral Gumma. 1206
				Symptoms of cerebral thrombosis (506). The attacks occur rather early in adult life. There are many prodromata. Nocturnal headache is common. The paralysis is moderate in degree, variable in intensity and often temporary. Mental derangement, often in the form of trance-like states, frequently occurs. Branches of the basilar artery are involved most frequently, and the attack often occurs during sleep, or without coma during the day.		Cerebral Syphilitic Endarteritis and Thrombosis. 1207
			Globulin and decided lymphocytosis is found in cerebro-spinal fluid from lumbar puncture.	Symptoms of meningitis (590, 608) which may be very slight and very variable. With severe headache (nocturnal) there may be some nausea and vomiting. Little or no elevation of temperature or retraction of neck. No tuberculin reaction or evidence of tuberculosis. This disease is rare in children.	Symptoms of cortical irritation (Jacksonian epilepsy, local headache and tenderness) paralysis of cortical functions (aphasia, monoplegia, etc.). Mental derangement is common, and often takes the form of paresis (pseudo-paresis), but is amenable to anti-syphilitic treatment.	Syphilitic Meningitis of Convexity of Brain. 1208
					No symptoms of cortical irritation or paralysis of cortical functions. Paralysis of cranial nerves (especially the oculomotorius), at times, of irregular distribution and in varying degree. Drowsiness and stupor are common.	Syphilitic Meningitis of Base of Brain, including Kahler's disease. 1209

Diagnostic Symptoms and Tests				Abstract of Symptoms	Diagnosis	
rash or its copper colored scars, hazy cornea, notched teeth, furrows about angle of mouth, saddle nose, ptosis, iritis, enlarged glands, periosteal nodes, etc.	under K.I. and Hg. or Salvarsan. Nocturnal headache is common, as are also the Argyll-Robertson's pupillary reflex, unequal pupils and optic neuritis.	Spinal symptoms. (Both forms of spinal syphilis may occur together.)	No globulin and little or no lymphocytosis found in cerebro-spinal fluid from lumbar puncture.	Symptoms of Brown-Séquard's paralysis, or later of paraplegia (442, 509, 838, 981).	Isolated Spinal Gumma (1042).	1210
				Symptoms of myelomalacia (485, 513-4, 517-8, 549-50).	Spinal Syphilitic Endarteritis and Thrombosis.	1211
				Symptoms of lateral sclerosis (525).	Erb's Syphilitic Lateral Sclerosis.	1212
			Globulin and decided lymphocytosis found in cerebro-spinal fluid from lumbar puncture.	Symptoms of spinal meningitis, or of pachymeningitis (550, 608, 974, 1005). Rigidity of back. Girdle pains and radiating pains, exaggerated reflexes in legs. Some of these cases present the symptoms of progressive spinal muscular atrophy (547).	Syphilitic Meningitis of Cord and of Nerve Roots. (Meningo-myelitis.)	1213
		Cerebral and spinal symptoms.	Globulin and decided lymphocytosis in cerebro-spinal fluid.	A combination of the above symptoms (1208-9, 1213) in very varying extent and intensity. A clinical picture presenting great variations from week to week.	Cerebro-spinal Syphilis.	1214
		Local peripheral symptoms.	Wasserman reaction in the blood. Normal cerebro-spinal fluid.	Symptoms of neuritis. (488-92, 882, 940-8.)	Syphilitic Neuritis.	1215
	Post-, or Meta-, syphilitic nervous disease.	Cerebral symptoms.	Increased lymphocytosis in cerebro-spinal fluid.	Symptoms of general paresis (1104).	Paresis.	1216
		Spinal symptoms.		Symptoms of locomotor ataxia (661).	Locomotor Ataxia. Tabes.	1217

Chart XIX

Abnormal Cerebro-Spinal Fluid

DIAGNOSTIC ANALYSIS OF SYMPTOMS
ABNORMAL CEREBRO-SPINAL FLUID

			Tests and Diagnostic Signs				Diagnosis
1220 ABNORMAL	1221 Butyric acid test positive.	1223 Leucocytosis.	Weichselbaum's diplococcus intra-cellularis meningitidis or rarely Pneumococcus.	Fluid may be clear or cloudy. Tension increased usually.	Occurs in epidemics.	Symptoms of epidemic Cerebro-spinal meningitis (591).	1226 Epidemic Cerebro-Spinal Meningitis.
			Weichselbaum's diplococcus. Pneumococcus Pfeiffer's bacillus Streptococcus Staphylococcus Typhoid bacillus. Bacterium coli, etc.	Fluid usually cloudy and under high tension.	Occurs sporadically.	Symptoms of sporadic or purulent cerebro-spinal meningitis (592).	1227 Sporadic Purulent Meningitis.
			Tubercle bacillus.	Fluid usually clear with delicate coagulum and under high tension.	Acute course.	Symptoms of tuberculous meningitis (593).	1228 Acute, or sub-acute Tuberculous Meningitis.
		1224 Lymphocytosis.	Tubercle bacillus.		Chronic course.		1229 Chronic Tuberculous Meningitis.
			Wassermann reaction positive.	Fluid clear and free from bacteria.	Tremor and mental symptoms.	Symptoms of Paresis (1104).	1230 Paresis.
					Ataxia.	Symptoms of Tabes (661).	1231 Tabes.
					Symptoms not typically characteristic of paresis or tabes.		1232 Cerebro-spinal Syphilis (1208-9, 1213-14).

ABNORMAL CEREBRO-SPINAL FLUID (Continued)

	Tests and Diagnostic Signs						Diagnosis
CEREBRO-SPINAL FLUID	Butyric Acid Test positive (continued)	Lymphocytosis (continued	Wassermann reaction negative.	Tension is usually increased but not very high.	Motor paralysis.	Symptoms of acute anterior poliomyelitis (495).	1233 Acute Anterior Poliomyelitis.
					Herpetic rash.	Symptoms of herpes zoster (1166).	1234 Herpes Zoster.
					Epidemic. High fever.	Symptoms of Typhus	1235 Typhus Fever.
					Choked disc usually present.	Symptoms of cerebral or spinal tumor (507, 578, 587).	1236 Tumor.
					Choked disc may be present.	Symptoms of cerebral or spinal abscess (508, 578, 587).	1237 Abscess.
						Symptoms of hydrocephalus (411,905,960).	1238 Hydrocephalus.
	1222 Butyric acid test negative.	1225 No Lymphocytosis or leucocytosis.	No bacteria and Wassermann negative.	Fluid clear with increased tension; in hemorrhage often bloody.	Headache	Symptoms of serous meningitis (594).	1239 Serous Meningitis.
					Apoplexy.	Symptoms of cerebral or spinal hemorrhage (503, 1061).	1240 Hemorrhage.
					Albumen and casts.	Examination of the urine shows albumen and casts. Edema, headache, dyspnoea, etc., usually present.	1241 Uremia.
					Anemia.	Examination shows anemia, pallor, etc., or acute infections or some similar conditions.	1242 Anemia.

PART III

LOCALIZATION

OF

LESIONS WITHIN THE NERVOUS SYSTEM

BY

A CONSIDERATION OF THE
PARALYTIC AND IRRITATIVE SYMPTOMS
RESULTING FROM THEM

Chart XX

Spinal Localization

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD

Modified from Wichman

SEGMENT INVOLVED	MOTOR CONDITIONS			REFLEX CONDITIONS		SENSORY CONDITIONS
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1250 V Sacral	None.	Coccygeus.	Elevation of coccyx.	Anal.	None.	Skin over sacrum and anus.
1251 IV Sacral	Coccygeus.	Levator ani. Sphincter ani. Detrusor urinae. Transversus perinei. Erector penis. Compressor urethrae.	Elevation of coccyx. Elevation of anus. Sphincter ani. Ejection of urine. Vaginal constriction.	Erection of penis diminished.	None.	Slightly larger area than above extending over inner portion of gluteal region.
1252 III Sacral	Sphincter ani. Levator ani. Detrusor urinae. Transversus perinei. Erector penis. Compressor urethrae.	Rectum.	Defecation disturbed. Retention of urine, later followed by dribbling. Ejaculation lost. Erection possible but paretic.	Ejaculation lost. Erection diminished. Tendo-Achillis.		As above, and perineum, genitals and upper part of inner surface of thighs. (Testicle sensitive to pressure.)
1253 II Sacral	Sphincter ani. Levator ani. Detrusor urinae and other muscles as in 3d sacral.	Pyriformis. Obturator internus. Gemellus superior. Gluteus maximus. Biceps femoris. Gastrocnemius. Soleus. Tibialis posticus. All the small muscles of foot.	Outward rotation of thigh. Retraction of thigh. Flexion of knee. Plantar flexion of foot. Standing on the toes. Raising inner margin of foot. Defecation and Retention of urine as in 3d sacral.	Ejaculation. Erection. Plantar weakened.	None.	As above, and the posterior surface and outer surface of thighs.

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD (Continued)

Modified from Wichman

Segment Involved	Motor Conditions			Reflex Conditions		Sensory Conditions
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1254 I Sacral	Muscles of anus. Muscles of bladder. Muscles of genitals. Pyriformis. Abductor hallucis. Flexor hallucis brevis. I-IV dorsal interossei. I-III plantar interossei. III-IV lumbricales. Abductor minimi digiti. Opponens minimi digiti.	Gluteus maximus. Obturator internus. Gemellus superior. Gluteus medius. Gluteus minimus. Biceps femoris. Semi-membranosus. Semi-tendinosus. Popliteus. Gastrocnemius. Soleus. Tibialis posticus. Peroneus longus. Peroneus brevis. Flexors of toes. Extensors of toes.	Retention of feces. Retention of urine or dribbling. Erection and ejaculation impossible. Outward rotation of thigh impaired. Internal rotation impaired. Flexion of knee difficult. Plantar flexion of foot. Raising inner margin of foot. Raising outer margin and dorsal flexion of foot. Flexion and extension of toes, adduction of great toe, abduction of little toe, etc.	Plantar weakened. Achilles-tendon reflex. Ejaculation. Erection. Micturition. Defecation. Gluteal.	None.	As above, and a strip on posterior and outer surface of lower legs and of dorsum of foot and especially of toes.
1255 V Lumbar	Muscles of anus and rectum. Muscles of bladder. Muscles of genitals. Pyriformis. Biceps femoris. Flexors of toes. Peroneus longus. Peroneus brevis.	Gemellus superior. Gemellus inferior. Gluteus medius. Gluteus minimus. Semimembranosus Semi-tendinosus. Gluteus maximus. Tensor faciae femoris. Gastrocnemius. Soleus Extensors of toes. Tibialis anticus.	Defecation. Micturition delayed, dribbling. Erection and ejaculation impossible. Outward rotation of thigh very difficult. Inward rotation impaired. Flexion of knee difficult. Retraction of thigh very difficult. Flexion of foot barely possible. Flexion of toes impossible. Extension of toes weak, except great toe, which may be dorsally flexed. Raising inner margin of foot difficult. Raising outer margin of foot impossible.	Ejaculation. Erection. Micturition. Defecation. Gluteal.	Plantar. Tendo-Achillis.	As above, and back of thighs and legs and inner and outer margin and sole of feet.

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD (Continued)

Modified from Wichman

Segment Involved	Motor Conditions			Reflex Conditions		Sensory Conditions
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1256 IV Lumbar	Muscles of rectum and anus. Muscles of bladder. Muscles of genitals. Obturator internus. Pyriformis. Gemelli. Gluteus medius. Gluteus minimus. Gluteus maximus. Biceps femoris. Semimembranosus. Semitendinosus. Popliteus. Gastrocnemius. Soleus. Flexors of toes. Extensors of toes. Peroneus brevis. Peroneus longus. Tibialis anticus.	Obturator internus. Rectus femoris. Vastus externus. Vastus internus. Adductor magnus. Adductor brevis. Adductor minimus. Gracilis.	Defecation, with fecal incontinence. Micturition, with dribbling. Erection and ejaculation impossible. Outward rotation of thigh weak. Inward rotation impossible. Retraction of thigh impossible. Flexion of knee lost. Plantar flexion of foot lost. Flexion and extension of toes lost. Raising outer margin of foot. Raising inner margin. Extension of thigh weak. Adduction difficult.	Patellar may be wanting.	Plantar.	As above, and inner side of lower legs and dorsum of feet, and strip on outer posterior surface of thighs.
1257 III Lumbar	Muscles of anus, bladder and genitals. Outward rotators and thigh. Inward rotators of thigh. Retractor (flexor) thigh. Flexors of knee. Plantar flexors of foot. Flexors of toes. Extensors of foot. Vastus externus.	Vastus internus. Rectus femoris. Crureus. Adductors of thigh. Flexors of thigh at the hips.	All movements of legs are lost, except that extension of legs is barely possible and that the thigh can be flexed on body by the psoas and iliacus. Defecation and micturition are destroyed. Urine and feces dribble and cannot be retained.	Patellar and cremasteric.	Ankle-clonus may exist.	As above, and whole of legs except a triangular area on front of thigh with base at Poupart's ligament.

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD (Continued)

Modified from Wichman

Segment Involved	Motor Conditions			Reflex Conditions		Sensory Conditions
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1258 II Lumbar	Paralysis of all muscles of lower extremity, except psoas.	Psoas.	Complete paralysis of legs, rectum and bladder. As above.	Patellar, Achilles, and cremasteric.	Achilles may be increased. Plantar.	Whole of legs and pelvis. (Testicles not sensitive to pressure.)
1259 I Lumbar	Total paralysis of whole lower extremity, psoas included.			Cremasteric and Achilles.	Patellar absent or increased.	As above, and groins and front of scrotum and penis.
1260 XII to III Dorsal	Paralysis of lower extremity, and gluteal region. Paralysis of abdominal and and dorsal regions, gradually added as the site of the lesion ascends.		As above, and paralysis of muscles of respiration causes diaphragmatic breathing and dyspnoea.	Epigastric and umbical reflex.	Patellar, cremasteric, Achilles and Plantar.	As above, and a band running around body about two segments below the one involved and limited above by a narrow zone of hyperesthesia.
1261 II Dorsal	As in 3d dorsal.		As above.	All below lost in complete division of cord.	All subjacent reflexes.	As above, and a strip on the inner side of the upper arms.
1262 I Dorsal	All muscles of trunk and lower extremities.	Flexion of fingers. Muscles of the little finger. III and IV interossei. Lumbricales. Pronator quadratus. Lower part of pectoralis major. Lower part of pectoralis minor.	As above and weakness in flexion of fingers. Pronation disturbed.	Oculo-pupillary symptoms. All below lost in complete division of cord.	All subjacent reflexes.	As above, and a strip on the inner side of the forearms.

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD (Continued)

Modified from Wichman

Segment Involved	Motor Conditions			Reflex Conditions		Sensory Conditions
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1263 VIII Cervical	Paralysis of muscles of trunk and lower extremities. Abductor of little finger. Adductor of thumb. Flexor of the little finger. Opponens minimi digiti. III and IV interossei. Lumbricales.	Flexors of the little finger. Opponens minimi digiti. Flexor subl. digitorum. Flexor profun. digitorum. Flexor carpi ulnaris. Extensors of the thumb and fingers. Triceps (slight). Latissimus dorsi (lower part). Pectoralis major. Pectoralis minor. Scalenus medialis. Scalenus posterior.	As above. Hand weak. Extension of arm. Int. rotation and retraction of arm. Adduction of arm.	Oculo-pupillary symptoms. All below lost in complete division of cord.	All below.	As above, and the fingers, except volar surface of the thumb and the ulnar surface of the little finger. The cervical sensory nerve roots supply the same area of the skin in common, especially in the hands and fingers. Hence the anesthesia is slight and uncertain.
1264 VII Cervical	Lower extremities and trunk. Flexor profundus digitorum (ulnar side). Flexor carpi ulnaris. Small hand muscles. Pronator quadratus.	Extensors, Flexors and Abductors of thumb. Extensor indicis. Extensors of the fingers (movements barely possible). Supinator longus. Biceps (very slightly paretic). Triceps. Pectoralis major. Serratus magnus (slight). Latissimus dorsi. Teres major.	As above and Hand very weak. (Winged scapulae.) Retraction and inward rotation of arm.	Arm reflexes. Forearm reflexes. Palmar reflex. All below lost in complete cord division.	All below.	As above, and most of the hands and a small strip on the anterior, another on the posterior, surface of the forearm.

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF THE CORD (Continued)

Modified from Wichman

Segment Involved	Motor Conditions			Reflex Conditions		Sensory Conditions
	Paralysis	Paresis	Actions lost or impaired	Absent	Increased in partial lesions	Anesthesia with a zone of hyperesthesia surrounding it or limiting it above
1265 VI Cervical	Muscles of lower extremity and trunk. Muscles of fingers (including thumb) and hand. Triceps. Pectoralis major. Latissimus dorsi. Teres major. Infraspinatus. Serratus magnus.	Coraco-brachialis. Biceps. Brachialis anticus. Supinator brevis. Deltoid. Scaleni. Splenii. Deep head and neck muscles.	As above and movements of fingers and thumb impossible. Extension of forearm. Flexion of forearm weak. Supination very weak. Adduction of arm and inward rotation. Adduction, retraction and external rotation. "Winged" scapulae. Raising of arm. Rotation of head. Fatal in a few days or weeks.	Arm reflexes. Extensor forearm reflexes. All below lost in complete cord division.	All below.	As above, and whole of hands and fingers and radial side of forearm.
1266 V Cervical	Muscles of lower extremities and trunk. All the muscles of the arm, forearm, hand and fingers; even the deltoid, coraco-brachialis and brachialis anticus. Deep cerviical muscles. Intercostals.	Levator anguli scapulae. Scaleni. Diaphragm (because of filaments from V cervical segment to phrenic nerve), or spread of injury from 5th to 4th cervical segment. Trapezius and sterno-cleid-omastoid are intact.	As above and shoulders raised with difficulty. Rotation and flexion of head. Dyspnoea. Fatal in a few hours or days.	Scapular and tendon reflexes of paralysed muscles in arms. All below lost in complete cord division.	All below.	As above, and whole of arms, except tip of shoulder.
1267 IV-I Cervical	Total cross-lesions from the fourth cervical segment upward are rapidly fatal, because of complete paralysis of the diaphragm and intercostals. Total cross-lesions of the brain-stem are rapidly fatal for the same reason.					

Chart XXI a

Cerebral Localization in the Medulla and Pons Ganglia at Base

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF BRAIN-STEM
LOCALIZATION IN MEDULLA AND PONS

Seat of Lesion	Paralysis of Motion	Paralysis of Sensation	Action Lost or Impaired	Reflexes Altered	Vertigo	Ataxia	Muscle Sense	Secretory and Other Disturbances
1268 Lesion involving lateral half of the medulla oblongata. Babinski and Nageotte's bulbar syndrome (437). Rare because of the small transverse area of the medulla. Thrombosis of posterior inferior cerebellar artery causes very similar symptoms. (Figs. 21-3)	Crossed paralysis: hemiplegia alternans hypoglossica. Homolateral half of tongue, diaphragm and vocal cord, contralateral arm and leg. In some cases arm and leg may be paralysed on both sides, but not equally so. Extremely rarely leg on one side and arm on the other are paralysed.	Taste in posterior part of homolateral half of tongue. All forms of sensation in pharynx and throughout the respiratory tract. Analgesia and thermic anesthesia of homolateral half of face and contralateral half of body. Anesthesia of one side, or of both sides of the body.	Articulation, phonation, deglutition, respiration, cardiac action, coughing, vomiting, use of tongue and of arms and leg on one or both sides.	Tendon reflexes increased with Babinski and ankle-clonus on opposite side. Cutaneous reflexes may or may not be increased	Usually present.	Usually present and of both motor and cerebellar type. Homolateral.	Usually lost, especially if motor ataxia be present.	Myosis and pseudo-ptosis (ophthalmoplegia sympathica) and salivation are common. Cheyne-Stokes's respiration (434).
1269 Pons Varolii (Fig. 20) Lesion in lower (caudad) third Confined to the bridge portion.	Crossed paralysis: hemiplegia alternans facialis. Muscles of expression of homolateral half of face and the external rectus at times (Foville's paralysis), and contralateral arm, leg and half of tongue (Millard-Gubber's syndrome—439).	None, unless indirectly from pressure and then contralateral hemianesthesia.	Articulation, winking, mastication. Movements of homolateral half of face, and of contralateral arm and leg.	Tendon reflexes increased with Babinski and ankle-clonus on opposite side. Cutaneous reflexes may or may not be increased.	Often present.	No motor, but there may be cerebellar, ataxia.	Normal	Conjunctivitis is frequent in eye of same side. May be a tendency to fall or to turn to one side. Salivation.
Confined to the tegmentum.	Muscles of expression of homolateral half of face and of external rectus. Contralateral arm and leg may be slightly involved.	Contralateral hemianalgesia and thermic anesthesia and at times hemianesthesia. Anesthesia, and especially analgesia, of homolateral half of face (Hemianesthesia alternans). Very rarely, deafness. Rarely dissociation of sensation.	Articulation, mastication, winking. Movements of homolateral half of face.	Normal or slightly exaggerated as above.	Usually present.	Usually present on the same side as the lesion.	Lost on the same side as the lesion.	Conjunctivitis is frequent in the eye of the same side. Salivation.

Seat of Lesion		Paralysis of Motion	Paralysis of Sensation	Action Lost or Impaired	Reflexes Altered	Vertigo	Ataxia	Muscle Sense	Secretory and Other Disturbances
LESION IN MIDDLE AND UPPER (CEPHALAD) THIRD	Confined to the bridge portion.	Complete contralateral hemiplegia.	Usually of all forms of sensation in homolateral half of face. Occasionally also hemianesthesia of contralateral half of body.	Chewing and usually articulation. Movements of contralateral half of the body.	Tendon reflexes increased with Babinski and ankle-clonus on the opposite side. Cutaneous reflexes may or may not be increased.	Often present.	No motor, may be cerebellar, ataxia.	Normal.	Ulceration of cornea may occur. May be a tendency to fall or turn to one side.
	Confined to the tegmentum.	Conjugate deviation of eyeballs toward the side of the lesion. May be complete hemiplegia of slight degree from pressure.	Paralysis of all forms of sensation on homolateral half of face Contralateral hemianalgesia. May be contralateral hemianesthesia.	Chewing and usually articulation. Conjugate movement of eyeballs toward the same side as the lesion.	Normal or may be slightly exaggerated.	Present.	May be motor and cerebellar ataxia.	Lost on the same side as as the lesion.	Ulceration of the cornea may rarely occur. A slow rhythmic tremor of the arm and leg of opposite side may be present.

Chart XXI b—Cerebral Localization—Ganglia at Base

TABLE OF SYMPTOMS IN TRANSVERSE LESIONS OF BRAIN STEM AND CEREBELLUM

Seat of Lesion		Paralysis of Motion	Paralysis of Sensation	Actions Lost or Impaired	Reflexes Altered	Vertigo	Ataxia	Muscle Sense	Secretory and Other Disturbances
1270 Crura Cerebri	Lesion confined to the pes or foot.	Some, or all of the ocular muscles (except external rectus) on the same side, combined with a contralateral hemiplegia, usually complete. Hemiplegia alternans oculomotoria. (Weber's syndrome, 440).	None.	Movement of eyeball. Use of half the body.	Tendon reflexes increased, with Babinski and ankle-clonus, on opposite side. Cutaneous reflexes may or may not be increased.	Usually absent.	None.	Normal.	Tremor resembling that of paralysis agitans (Benedikt's syndrome).
	Lesion confined to the tegmentum.	One or more ocular muscles, except the abducens.	Controlateral hemianesthesia, or hemianalgesia and thermic hemianesthesia, or both. Deafness may be present if lesion be bilateral.	Movement of eyeball.	Normal.	Present.	Cerebellar type.	Impaired.	A slow, rhythmic tremor of arm and leg of opposite side may be present.
1271 Corpora Quadrigemina.	Lesion confined to anterior pair (nates).	Bilateral, more or less extensive, of all ocular muscles, except the abducens.	May be blindness without choked disc or other lesion.	Movement of eyeball.	Pupil reflex lost to both light and accommodation.	Usually absent.	May be absent.	Normal.	Nystagmus (at times vertical), squint, pupils often unequal.
	Lesion confined to posterior pair (testes).	None or may be slight paralysis as above or Trochlearis.	May be deafness if lesion be bilateral.	None, except chewing at times.	Normal.	Usually present.	Present. Of cerebellar type.	Normal.	May be slow, rhythmic tremor of arm and leg of opposite side, especially on voluntary motion.
1272 Cerebellum.		None.	None.	Walking and standing.	Normal or slightly exaggerated.	Usually present.	Cerebellar ataxia with hypotonia almost always present.	Normal.	Nystagmus, tendency to fall to one side, occipital headache is frequent, cerebellar fits may occur.
1273 Middle cerebellar peduncles.		None.	None.	Walking, standing and sitting.	Normal or slightly exaggerated.	Usually present.	Usually present with hypotonia of the cerebellar type.	Normal.	Tendency to fall or to turn eyes, head or body to one side. Rotatory movements, more or less pronounced, choreic-spasms in homolateral half of body and vertical divergence of the eyeballs sometimes occur.

Lesions of inferior cerebellar peduncles cause lateropulsion; those of the superior cerebellar peduncles cause choreiform movements and cerebellar ataxia.

1274 Base of Cranium. Fractures, tumors, etc., at base of skull may cause many of the above symptoms according to their position, but their early and characteristic symptom is paralysis of one or more of the cranial nerves. Symptoms of paralysis predominate over those of irritation.

Small lesions, not so extensive as to involve the entire lateral half of the brain stem, may occur at any point. The symptoms of these lesions depend upon the function (physiology) of the part affected and will naturally vary greatly. The location of such a lesion in a transverse section will depend upon what longitudinal fiber tracts are involved, and in longitudinal section upon what cranial nuclei and nerves parts are involved, as shown by the symptoms present in any case. A study of the figures at the end of this book is essential for the localization of such lesions and will serve this purpose better than a long verbal description.

Chart XXI c—Cerebral Localization—Ganglia at Base

LOCALIZING SYMPTOMS IN LESIONS OF GANGLIA AT BASE OF BRAIN

Seat of Lesion		Diagnostic Symptoms
1275 Optic Thalamus. (Fig. 17)		Symptoms are variable and uncertain. May be hemianopia (pulvinar, and external geniculate involvement) with hemiopic pupillary reaction, contralateral hemianalgesia. Rigidity, choreiform movements, athetosis, and incoordination of contralateral leg, arm, and half of face may be present. The above mentioned motor disturbances occur also in lesions just external to the optic thalamus which involve the fibers connecting the thalamus with the cerebral cortex. Sensory disturbances (pain, hemianesthesia dolorosa, anesthesia, loss of muscle sense) may be present in the same parts. Absence of emotional expression in face, even when not paralysed. Vaso-motor disturbances may occur in opposite side of body. Isolated analgesia or thermic anesthesia does not occur in lesions above the optic thalamus, but other forms of anesthesia do.
1276 Corpus Striatum. (Fig. 17)	Nucleus Lenticularis and Nucleus Caudatus.	No diagnostic symptom except the hemiplegia due to the involvement of the internal capsule. In rare cases a lesion of the nucleus lenticularis may be of such a form as to injure the anterior and posterior part of the posterior limb of the internal capsule, while its middle part escapes. In such cases there results a hemiplegia which involves the leg and face more than the arm. Dysarthria is a not uncommon symptom and in some cases the symptoms of sensory irritation: muscle spasm and incoordination described under lesions of the optic thalamus have been present. When the ganglia on both sides are affected, voluntary voiding of urine may be impossible while automatic involuntary voiding may occur at regular intervals.
	Internal Capsule.	Lesions in the anterior limb of the internal capsule cause either no symptoms or a paralysis of contralateral half of face. May have ataxia and athetoid movements.
		Lesions in the anterior two-thirds of the posterior limb of the internal capsule cause a total contralateral hemiplegia of the body. This hemiplegia consists purely of a muscular paralysis and never produces a paralysis of the cortical functions such as aphasia, alexia, etc; but may produce dysarthria.
		Lesions in the posterior third of the posterior limb of the internal capsule cause hemianesthesia and loss of muscle sense on the opposite side of the body.
		Lesions at the extreme posterior end of the posterior limb of the internal capsule, in addition to hemianesthesia, cause contralateral hemianopia, some deafness and often the symptoms of motor irritation, described under lesions of optic thalamus.
1277 Corpus Callosum.		No diagnostic symptoms.
1278 Island of Riel, Claustrum and External capsule. (Fig. 17)		Lesions in this area produce disturbances of speech, grouped under the general term paraphasia, and may produce anarthria, the result of complete aphasia.
1279 Pituitary Gland.		Hypertrophy, tumor, hemorrhage and some other lesions of the gland associated with excess of secretion may cause acromegaly or gigantism, in addition to a progressive bi-temporal hemianopia terminating in blindness. A defect or atrophy of the gland associated with a diminution of secretion in early life may cause dwarfism and may produce pituitary eunuchismus or adiposogenital degeneration with excess of fat and a defect in the formation of the genitals. In any case of pituitary disease there may be polyuria, polydipsia and occasionally glycosuria and very rarely an escape of cerebrospinal fluid from the nose (hydrorrhoea nasalis). In some cases of pituitary disease there are no symptoms.
1280 Pineal Gland.		Abnormal growth of hair and deposition of fat. Abnormalities of genitals (at times with attacks of sexual excitement). Excessive growth in height of body (dyspinelismus). In consequence of involvement of adjacent tissue, bilateral ocular paralysis, nystagmus, pupil abnormalities, ataxia, and perhaps disturbances of hearing may be present.

Chart XXI d—Cerebral Localization—Lobes of Brain

LOCALIZING SYMPTOMS IN LESIONS OF CEREBRAL HEMISPHERES

Seat of Lesion		Diagnostic Symptoms
1282 FRONTAL LOBE Contains the centers for all the skilled acts, especially the left lobe. Large lesions in the frontal lobes may cause a change in character and disposition of the patient. Many lesions, especially tumors, cause Jacksonian epilepsy, especially when situated in posterior part of lobe; while lesions in anterior part of lobe may cause epileptiform convulsions. Ataxia sometimes occurs in tumors in the frontal lobe. (Fig. 15)	The ascending frontal convolution. Lesions in this region may cause awkwardness (cortical ataxia, apraxia) rather than paralysis.	Lesion in the upper fourth of this convolution may cause Jacksonian epilepsy commencing in, and motor paralysis of, the contralateral leg. Very large lesions (hemorrhage, tumors, etc.) in this region may cause also paralysis of the homolateral leg in a lesser degree.
		Lesions in the middle half of the convolution may cause Jacksonian epilepsy commencing in, and awkwardness of, or loss of skill, or complete paralysis of, the contralateral arm. Very minute lesions in the upper part of this region, may affect only the shoulder; in the lower part, only the hand.
		Lesions in the lower fourth of this convolution may cause Jacksonian epilepsy commencing in, and paralysis of, the contralateral half of face and neck. Very minute lesions in the upper part of this region, may affect only the eyes; in the lower and anterior part, the tongue and larynx.
	The base of the middle left frontal convolution.	Small lesions in this area may cause in right-handed persons, argaphia, and in many cases Jacksonian epilepsy, commencing in the contralateral arm.
	The base of the inferior left frontal convolution.	Small lesions in this area may cause, in right-handed persons, motor aphasia, and in many cases Jacksonian epilepsy, commencing in the right side of the face.
1283 PARIETAL LOBE Contains the centers for cutaneous and muscular sensation. Many lesions, especially tumor, cause Jacksonian epilepsy when situated in the anterior portion of this lobe; while lesions in posterior portion may cause epileptiform convulsions. (Fig. 15)	The ascending parietal convolution.	Lesions in the upper fourth of this convolution may cause some blunting of cutaneous sensibility, and especially astereognosis in contralateral leg and foot.
		Lesions in the middle half of this convolution may cause some blunting of cutaneous sensibility, and especially astereognosis in contralateral arm and hand.
		Lesions in the lower fourth of this convolution may cause some blunting of cutaneous sensibility, and especially astereognosis in contralateral half of face.
	The left angular gyrus.	Deep lesions in this region, in right-handed persons may cause alexia and hemianopia.
	The rest of the parietal cortex.	Lesions in this region may cause loss of muscular sense and motor ataxia in the contralateral arm and leg.
1284 TEMPORAL LOBE Contains, on the left side, the centers of sensory speech. Lesions may cause epileptiform convulsions. (Fig. 15)	Base of the left superior temporal convolution.	Lesions in this region, in right-handed persons, may cause sensory aphasia (psychic deafness)
1285 OCCIPITAL LOBE Contains the centers of sight. Lesions may cause epileptiform convulsions. (Fig. 15)	Neighborhood of calcarine fissure.	Lesions in this area cause contralateral homonymous hemianopia. A lesion limited to the superior lip of this fissure causes quadrantic hemianopia or tetartanopia of the contralateral lower quadrants of field of vision. A lesion limited to the inferior lip of this fissure causes loss of contralateral upper quadrants of the field of vision.
	Rest of occipital lobe.	Lesions in this area may cause loss of power of recognition of persons and things (psychic blindness).
1286 Cortical Lesions. (Fig. 15)		Many lesions cause a mixture of paralysis and convulsions over a limited area which in some cases may slowly grow larger. The intelligence of the patient is always more or less impaired.

Chart XXII
Cerebro-Spinal Localization

TOPICAL DIAGNOSIS

LOCALIZATION OF LESIONS FROM ANALYSIS OF SYMPTOMS

- 1290 Paralysis. The most important of all localizing symptoms.
  - 1292 The reflexes in the paralysed area are abolished (except in 1310 and 1329) A lesion of the peripheral neurons.
    - 1294 Sensation alone, in all its forms is lost or impaired.
    - 1295 Motion alone is lost or impaired.
    - 1296 Both motion and sensation are lost or impaired.
    - (1294, 1295, 1296) See Chart XXII a.
    - 1297 Special forms of peripheral paralyses. See Chart XXII b.
  - 1293 The reflexes are present (except in 1357 and 1359) A lesion of the central neurons.
    - 1298 Sensory paralysis dominant. Little or no motor paralysis. See Chart XXII c.
    - 1299 Motor paralysis dominant. Little or no sensory paralysis. See Chart XXII d.
    - 1300 Both motor and sensory paralysis.
- 1291 Jacksonian Epilepsy, together with other symptoms of cerebral disease.
- (1300, 1291) See Chart XXII e.

For diseases and lesions accompanied by *motor paralysis* see 469, by *motor spasm* see 570, by *ataxia* see 638, by *tremor* see 639, by *nystagmus* see 640, by *fibrillation* see 641, by *local paralysis* see 636, by *local spasm* see 637, by *disorders of speech* see 735, by *disorders of gait* see 736, by *anesthesia and analgesia* see 810, by *disorders of special senses* see 807-9, by *pain* see 931, by *vertigo* see 932, by *mental disorders* see 1036, by *trophic disorders* see 1120, by *vaso-motor disorders* see 1129, by *ganglionic disorders* see 1128, by *syphilis* see 1205, by *abnormal cerebro-spinal fluid* see 1220.

Chart XXII a—Cerebro-Spinal Localization
Paralysis with Abolished Reflexes

TOPICAL DIAGNOSIS

LOCALIZATION OF LESION FROM ANALYSIS OF SYMPTOMS

	Diagnostic Symptoms and Tests						Localization	
REFLEXES ABOLISHED	1294 Sensation alone, in all its forms, is lost or impaired.		Area of anesthesia, etc., lies within the area of distribution of one or more nerves.	Onset acute or sub-acute.	Nerve involved, if palpable, is tender on pressure. No symptom of disease of central organs usually, unless nuclei are affected.		Lesion is in one or more sensory cranial nerves or nuclei; the nerve affected depending upon its anatomical distribution (822).	1301
			Area of anesthesia, etc., lies within the area of distribution of one or more nerve roots.	Onset acute or chronic.	Nerves involved, if palpable, are not tender. May be symptoms of disease of central organs.		Lesion is in corresponding sensory nucleus in the brain stem, or in the posterior horn of spinal cord, or in column of Burdach, or in posterior nerve root.	1302
	1295 Motion alone is lost or impaired.		The paralysis is limited to muscles supplied by one or more nerves.	Onset acute or sub-acute. No fever at onset.	Nerve involved, if palpable, is tender on pressure. No symptoms of disease of central organs. All the muscles supplied by the nerve are paralysed, usually.		Lesion is in one or more motor cranial nerves, or a mild lesion of mixed spinal nerves; the nerve affected is the nerve supplying the paralysed muscles (489, 492).	1303
			The paralysis is limited to muscles supplied by one or more nerve roots.	Onset acute or chronic. May be fever at onset.	Nerve involved, if palpable, not tender. May be symptoms of disease of central organs. Often only a portion of the muscles innervated by the nucleus are paralysed.		Lesion is in corresponding motor nucleus within brain stem, or in anterior horn of spinal cord, or in the anterior nerve root (493).	1304
	1296 Both motion and sensation are lost or impaired.	UNILATERAL	Motor and sensory paralysis is within the area of distribution of one spinal nerve.	Onset acute or sub-acute. No fever at onset.	Nerve involved; tender on pressure. No symptoms of disease of central organs.		Lesion in one spinal nerve (489).	1305
			Motor or sensory paralysis is within the area of distribution of several nerves from one plexus.				Lesion in brachial or lumbar plexus (490).	1306
		BILATERAL	Motor and sensory paralysis extends over legs or arms or both, or even more generally.	Onset acute or sub-acute. May be fever at onset.	Nerves involved tender on pressure. No symptoms of disease of central organs.	Muscles show weakness, tenderness and rapid atrophy.	Lesion of many spinal and (rarely) cranial nerves also (multiple neuritis) (488).	1307
					Nerves involved not tender. There are disturbances of organic reflexes and other symptoms of organic disease of central organs.	Legs alone are paralysed and exhibit trophic disturbances. Anesthesia of rectum and bladder. Great pain. May be deformity of lumbar spines. Symptoms less symmetrical and bed-sores less common than in lumbar lesions. Domain of anterior crural nerve may be normal when lesion is low.	Lesion of cauda equina (487).	1308
						Legs alone are paralysed and exhibit trophic disturbances. Anesthesia of rectum and bladder. Little pain. May be deformity of lower dorsal spines. Symptoms symmetrical. Bed-sores always present. No portion of legs escape.	Lesion of lumbar enlargement of spinal cord (484-7).	1309
						Both legs and arms are paralyzed. There are trophic disturbances in arms but not in legs. Reflexes are abolished in arms, exaggerated in legs (548-51).	Lesion of cervical enlargement of spinal cord	1310

Chart XXII b

Cerebro-Spinal Localization

LOCALIZATION OF LESION FROM ANALYSIS OF SYMPTOMS

PERIPHERAL PARALYSIS WITH ABOLISHED REFLEXES

			Diagnostic Symptoms and Tests	Localization	
1297 Special forms of peripheral paralysis. Reflexes abolished in paralysed area, except in 1329.	1315 Disturbances of vision. (807)		Blindness of entire field of vision of one eye is present. Optic nerve is atrophied. Pupil does not respond to light.	Lesion in optic nerve (897-8).	1318
			Bitemporal hemianopia is present. The outer half of each field of vision is blind. Hemiopic pupillary reflex is present.	Lesion is in the central part of optic chiasm (362, 815, 860, 892).	1319
			Nasal hemianopia is present. The inner half of field of vision of one eye is blind. Hemiopic pupillary reflex is present.	Lesion is in outer margin of optic chiasm (362, 815, 861).	1320
			Homonymous hemianopia is present. Identical halves (right or left) of each field of vision is blind. Hemiopic pupillary reflex is present.	Lesion is in the optic tract or external geniculate body of opposite side (858).	1321
	1316 Paralysis of ocular muscles. (700)		All muscles of one eye paralysed. Eyeball protruded or other evidence of disease within orbit.	Lesion within the orbit (777).	1322
		All muscles supplied by third cranial nerve are paralysed at once.	No hemiplegia. Other cranial nerves paralysed.	Lesion of 3rd cranial nerve trunk or nucleus (700).	1323
			Paralysis of arm and leg of opposite side.	Lesion involving crus cerebri (676).	1324
			Tremor of arm and leg of opposite side present at rest and exaggerated on motion, causing ataxia.	Lesion of red nucleus or rubro-spinal tract on same side as motor oculi paralysis (380, 573).	1325
			Partial or progressive paralysis of muscles supplied by third cranial nerve (700).	Lesion of 3rd cranial nucleus, in whole or in part (700).	1326
		Paralysis of external rectus muscle.	No hemiplegia. Other cranial nerves paralysed, especially the facial.	Lesion of 6th cranial nerve or nucleus (1317).	1327
			Hemiplegia often combined with hemianesthesia of opposite side. Loss of power of conjugate deviation of eyes to right or left. Facial or auditory nerve may be involved.	Diffuse lesion of Pons Varolii (539, 884).	1328

PERIPHERAL PARALYSIS WITH ABOLISHED REFLEXES (Continued)

Diagnostic Symptoms and Tests			Localization	
1317 Facial paralysis. (703)	Lower branch of facial only or, mainly, paralysed.	Other symptoms of disease of the brain present. Electrical reaction of degeneration never present. Reflexes present.	Lesion above nucleus of facial nerve in cerebral hemispheres or in crura cerebri.	1329
	Both lower and upper branches of facial nerve equally paralysed.	Paralysis of arm and leg of opposite side. Often abducens paralysis.	Lesion in Pons Varolii.	1330
		No hemiplegia. Chronic course usually. Other cranial nerves, especially auditory and abducens, may be affected.	Lesion of nucleus of facial nerve.	1331
		Associated with unilateral deafness and vertigo without disease of the ear.	Lesion of facial nerve trunk at base of brain.	1332
		No deafness but hyperakusis and tinnitus aurium, due to stapedius paralysis. Low notes, and often the high notes also, are painful to hear. No loss of taste. At times absence of secretion of tears.	Lesion of nerve above geniculate ganglion. (928)	1333
		Hyperakusis. Loss of taste in anterior two-thirds of tongue of same side.	Lesion of facial nerve between geniculate ganglion and stapedius branch.	1334
		No hyperakusis. Loss of taste in anterior two-thirds of tongue of same side.	Lesion of facial nerve between stapedius and chorda tympani branches.	1335
		No hyperakusis. No loss of taste. Tenderness near stylo-mastoid foramen.	Lesion of facial nerve below chorda tympani branch.	1336

Chart XXII c
Cerebro-Spinal Localization

TOPICAL DIAGNOSIS

LOCALIZATION OF LESION FROM ANALYSIS OF SYMPTOMS

ANESTHESIA WITH EXAGGERATED REFLEXES

Diagnostic Symptoms and Tests.					Localization	
1298 Sensory paralysis dominant. Little or no motor paralysis. Tendon reflexes present or exaggerated.	1340 Anesthesia with or without analgesia.	Limited to one or both legs.	Marked ataxia.	Anesthesia marked, bilateral. May be other spinal symptoms, especially loss of muscle sense.	Lesion in one of both posterior columns of cord in dorsal region. Same side if unilateral (654a, 785).	1347
			Slight ataxia.	Anesthesia slight and most marked in foot. Almost always unilateral. May be cerebral symptoms, Jacksonian epilepsy, etc.	Lesion in upper one-fourth of posterior central convolution in cerebral cortex.	1348
		Limited to one arm.	Slight ataxia.	Anesthesia slight, most marked in hand, astereognosis marked. May be other cerebral symptoms (Jacksonian epilepsy). Usually some motor paralysis.	Lesion in middle one-half of posterior central convolution in contralateral cerebral cortex.	1349
		In both arms and both legs.	Marked ataxia.	May be other spinal symptoms. Dyspnoea common. Loss of muscle sense in arms and legs.	Lesion of posterior columns of cord in cervical region (654a, 785).	1350
		In arm and leg of same side.	Marked ataxia.	May be other spinal symptoms. Dyspnoea common. Loss of muscle sense in arm and leg.	Lesion of posterior column of cord on same side in cervical region (654a, 785).	1351
			Slight ataxia.	Anesthesia slight, most marked in hand and foot. Astereognosis marked. May be other cerebral symptoms, especially Jacksonian epilepsy.	Lesion in upper three-fourths of posterior central convolution of contralateral cerebral cortex.	1352
		In arm and leg of one side and in other side of face.	Moderate ataxia.	May be paralysis of other cranial nerves.	Lesion in tegmentum of Pons Varolii on same side as the facial anesthesia (884).	1353
		In arm, leg and face of same side.	Slight ataxia.	No Jacksonian epilepsy. Hemianopia common.	Lesion of posterior part of internal capsule of contralateral hemisphere (857, 1276).	1354
				Jacksonian epilepsy common. No hemianopia. Mental deterioration.	Lesion of superior parietal lobule of contralateral hemisphere.	1355

				Diagnostic Symptoms and Tests	Localization	
1298 Sensory paralysis dominant. Little or no motor paralysis. Tendon reflexes present or exaggerated (Continued).	1341 Analgesia with thermic anesthesia, but little or no tactile anesthesia, is present. Dissociation of sensation.	In one or both legs.	Usually unilateral.	No trophic disturbances. No disturbance of organic reflexes. Usually ataxi.	Lesion in periphery of opposite lateral column of cord in dorsal region (1131, 1360).	1356
			Usually bilateral.	Trophic disturbances in legs. Organic reflexes disordered. Tendon reflexes usually abolished, especially in advanced cases.	Lesion in central gray matter (anterior commissure) of cord in lumbar enlargement. In central gliosis the lesion may extend upwards to the cervical enlargement and involve the arms secondarily.	1357
		In one or both arms.	Usually unilateral. Leg of same side also involved.	No trophic disturbances. Often ataxia without loss of muscle sense.	Lesion in periphery of the opposite, or of both, lateral columns of the cord in the cervical region (1360).	1358
			Usually bilateral. Legs of normal sensibility.	Trophic disturbances in arms. Tendon reflexes usually abolished in arms, especially in advanced cases.	Lesion in central gray matter (anterior commissure) of the cord in cervical enlargement (Syringomyelia) (552, 693, 837, 1009, 1170).	1359
		In arms or legs or both.	Bilateral usually marked ataxia.	May be other spinal symptoms. Always some motor paralysis (spastic paraplegia).	Lesion of lateral columns of cord (554, 1127, 1129, 1139, 1141, 1144).	1360
			Unilateral. slight ataxia.	Hemianopia and anesthesia usually present. Other cerebral symptoms.	Lesion of posterior part of contralateral internal capsule (734).	1361
				Jacksonian epilepsy and other cerebral symptoms usually present. Anesthesia present.	Lesion of inferior parietal lobule of contralateral hemisphere.	1362
				In contralateral arm and leg with deafness.	Lesion of ponto-cerebellar angle on side of deafness (397).	1363
	1342 Homonymous hemianopia.	Identical halves of each field of vision (right or left) are blind. No hemiopic pupillary reflex. Other cerebral symptoms.			Lesion of edges of calcarine fissure of occipital lobe, or of fasiculus of Gratiolet of contralateral cerebral hemisphere (362, 815, 890, 1285).	1364
	1343 Homonymous Tetaranopia. Quadrant hemianopia.	Identical quadrants of each field of vision (right or left) are blind. No hemiopic pupillary reflex. No hemianesthesia or other paralysis. May be other cerebral symptoms.	Lower quadrant of field of vision.		Lesion of upper lip of contralateral calcarine fissure (363, 815, 1285).	1365
			Upper quadrant of field of vision.		Lesion of lower lip of contralateral calcarine fissure.	1366
	1344 Psychic blindness.	Patient is not blind but cannot recognize things by sight, though he may by touch or hearing. Has forgotten what he has seen.			Lesion of cortex of occipital lobe of left cerebral hemisphere (232, 1285).	1367
	1345 Sensory aphasia.	Patient is not deaf but cannot understand words spoken to him, although he understands them when he sees them written. Has no memory for spoken words.			Lesion of cortex or sub-cortex of posterior part of left superior temporal convolution (222, 772).	1368
	1346 Astereognosis.	Patient is not anesthetic, or very slightly so, but cannot recognize objects by the sense of touch, although he can by the sense of sight.			Lesion in cortex or sub-cortex of the posterior central convolution of contralateral hemisphere (229, 354).	1369

Chart XXII d

Cerebro-Spinal Localization

LOCALIZATION OF LESION FROM ANALYSIS OF SYMPTOMS

MOTOR PARALYSIS WITH EXAGGERATED REFLEXES

Diagnostic Symptoms and Tests				Localization	
1299 Motor paralysis dominant. Little or no sensory paralysis. Tendon reflexes present or exaggerated.	Limited to one or both legs. Organic reflexes not disordered.	Symptoms bilateral usually.	May be other spinal symptoms. Often ataxia and dissociation of sensation in legs.	Lesion of contralateral, or of both lateral columns of cord in dorsal region (1356, 1358, 1360).	1372
		Symptoms unilateral usually.	May be other cerebral symptoms, especially Jacksonian epilepsy.	Lesion of upper part of anterior central convolution of contralateral hemisphere, cortical or sub-cortical.	1373
	Limited to both arms and both legs. Organic reflexes not disordered.		No sensory paralysis. No cerebral symptoms. Often ataxia and dissociation of sensation in arms and legs.	Lesion of lateral columns of the cord in the cervical region (1144).	1374
			Usually some sensory paralysis. Dysarthria and dysphagia. Paralysis of cranial nerves varying with position of lesion.	Lesion of the brain stem (involvement of pyramidal tract in the medulla, pons or crura cerebri).	1375
	Limited to one arm.		Occasionally some slight sensory paralysis. Jacksonian epilepsy and other cerebral symptoms common.	Lesion in cortex or sub-cortex of middle one-half of anterior central convolution of contralateral hemisphere.	1376
	Limited to arm and leg of same side.		Dissociation of sensation and ataxia may be present. Organic reflexes not disordered. No cerebral symptoms.	Lesion of contralateral lateral column of cord in cervical region (1131, 1141).	1377
			Usually some sensory symptoms. Dysarthria and dysphagia common. Paralysis of some cranial nerves frequent.	Lesion in the brain stem (involving the pyramidal tract).	1378
			Usually some sensory symptoms. Jacksonian epilepsy and other symptoms of cortical disease.	Lesion in cortex or sub-cortex of upper three-fourths of anterior central convolution of contralateral hemisphere.	1379

MOTOR PARALYSIS WITH EXAGGERATED REFLEXES (Continued)

	Diagnostic Symptoms and Tests			Localization	
1299 Motor paralysis dominant. Little or no sensory paralysis. Tendon reflexes present or exaggerated. (Continued)	Limited to lower branch of facial nerve.		Jacksonian epilepsy and other symptoms of cortical disease common. Often complicated with motor aphasia.	Lesion in cortex or sub-cortex of inferior part of anterior central convolution of contralateral hemisphere (face center).	1380
	Limited to arm and lower branch of facial nerve of same side.			Lesion of cortex or sub-cortex of lower three-fourths of anterior central convolution of contralateral hemisphere (arm and face centers).	1381
	Limited to arm and leg of same side and hypoglossus nerve of opposite side.		Usually some sensory symptoms. Dysarthria and dysphagia. Paralysis of some other cranial nerves common, especially abducens paralysis.	Lesion of medulla on same side as the hypoglossus paralysis (rare condition).	1382
	Limited to arm and leg of same side and lower branch of facial nerve of opposite side.			Lesion in bridge portion of pons on same side as the facial paralysis.	1383
	Limited to arm and leg of same side and motor oculi nerve of opposite side.		Usually some sensory symptoms. Paralysis of other cranial nerves common.	Lesion in pes cruris cerebri on same side as the motor oculi paralysis.	1384
	Limited to arm and leg and lower branch of facial nerve on same side.	Symptoms of paralysis rather than of irritation. Not progressive.	Usually other cerebral symptoms present. No sensory symptoms.	Lesion in anterior part of posterior limb of internal capsule of opposite hemisphere.	1385
			Often sensory symptoms present. Paralysis of emotional expression on opposite side of face, athetosis, etc.	Lesion in posterior part of optic thalamus and corpus striatum of opposite hemisphere.	1386
		Symptoms of irritation. Jacksonian epilepsy.	No objective sensory symptoms. Often motor aphasia.	Lesion throughout anterior central convolution of contralateral hemisphere (cortex or sub-cortex).	1387
	Dysarthria and dysphagia.	Paralysis of some of the cranial nerves and usually of arm and leg also.		Lesion in tegmentum of pons or medulla (284-5).	1388
	Agraphia	Loss of power of writing, although arm is not paralysed.		Cortical or sub-cortical lesion at base of middle frontal convolution of left cerebral hemisphere in right handed person (227, 776).	1389
	Motor aphasia	Loss of power of speaking some or all words. Limited vocabulary. Sounds can be made and muscles of speech not paralyzed.		Cortical or sub-cortical lesion at base of inferior left frontal convolution in right handed person (221, 771).	1390
	Alexia.	Inability to read, although patient can see and can speak.		Sub-cortical lesion of left angular convolution in right handed person (228, 773).	1391

Chart XXII e

Cerebro-Spinal Localization

TOPICAL DIAGNOSIS

LOCALIZATION OF LESION FROM ANALYSIS OF SYMPTOMS

MOTOR AND SENSORY PARALYSIS WITH EXAGGERATED REFLEXES
JACKSONIAN EPILEPSY

Diagnostic Symptoms and Tests			Localization	
1300 Both motor and sensory paralysis. Reflexes present or exaggerated, except in 1396.	Limited to both legs.	Paralysis severe. No ataxia. Organic reflexes much disordered. Some of the trunk reflexes are lost. Vertical extent of lesion is shown by the absence of the different trunk reflexes. Upper limit of lesion shown by the zone of hyperesthesia, limiting the anesthesia above.	Transverse lesion of spinal cord in dorsal region. (Myelitis.) (485, 513 517, 549, 980)	1395
		Paralysis not so extreme. Marked ataxia. Loss of muscle sense. Organic reflexes not at all or slightly disordered. Trunk reflexes not abolished. Knee-jerks and other leg reflexes may be increased or abolished.	Lesion both in lateral and posterior columns of cord. (Ataxia paraplegia.) (526, 660, 796)	1396
	Limited to both arms and both legs.	No involvement of cranial nerves. Priapism. Dyspnoea. Very dangerous, usually fatal.	Transverse lesion of spinal cord in cervical region. (512, 828)	1397
		Involvement of some cranial nerves. Dysarthria and dysphagia. Very dangerous, usually fatal.	Lesion on both sides of brain stem (medulla, pons or crura cerebri, according to cranial nerves involved).	1398
1291 JACKSONIAN EPILEPSY		Spasmodic twitching of head and eyes to one side. Twitching may remain limited to these muscles or may extend to other muscles of face and neck and arm and later to leg of same side or may finally extend to muscles of both sides of body.	Lesion in or near base of middle frontal convolution of contralateral hemisphere.	1399
		Spasmodic twitching commences in one side of face. Twitching may remain limited to these muscles or may extend to others as above.	Lesion in or near lower quarter of the central convolution of contralateral hemisphere.	1400
		Spasmodic twitching in hand or arm. Twitching may remain limited to these muscles or may extend to face or to leg or to both simultaneously of same side and may later extend to muscles of other side of body also.	Lesion in or near middle half of the central convolutions of contralateral hemisphere.	1401
		Spasmodic twitching of foot or leg. Twitching may remain limited to these muscles, or may extend to arm and later to face of same side and later to muscles of other side of body.	Lesion in or near upper quarter of central convolutions or paracentral lobule of opposite hemisphere.	1402
		Spasmodic twitching commencing simultaneously in arm and face of same side, which later extends to muscles of the leg of the same side and still later to muscles of the opposite side of the body.	Lesion near and equally distant from motor area of face and arm in contralateral hemisphere.	1403
		Spasmodic twitching commencing in arm and leg of same side, which may later extend to face of same side and may later extend to muscles of the other side of body.	Lesion near and equally distant from motor area of arm and leg in contralateral hemisphere.	1404
		Spasmodic twitching commencing in face and arm and leg of same side, which may later extend to muscles of opposite side.	Lesion in inferior parietal lobule of contralateral hemisphere.	1405

PLATES

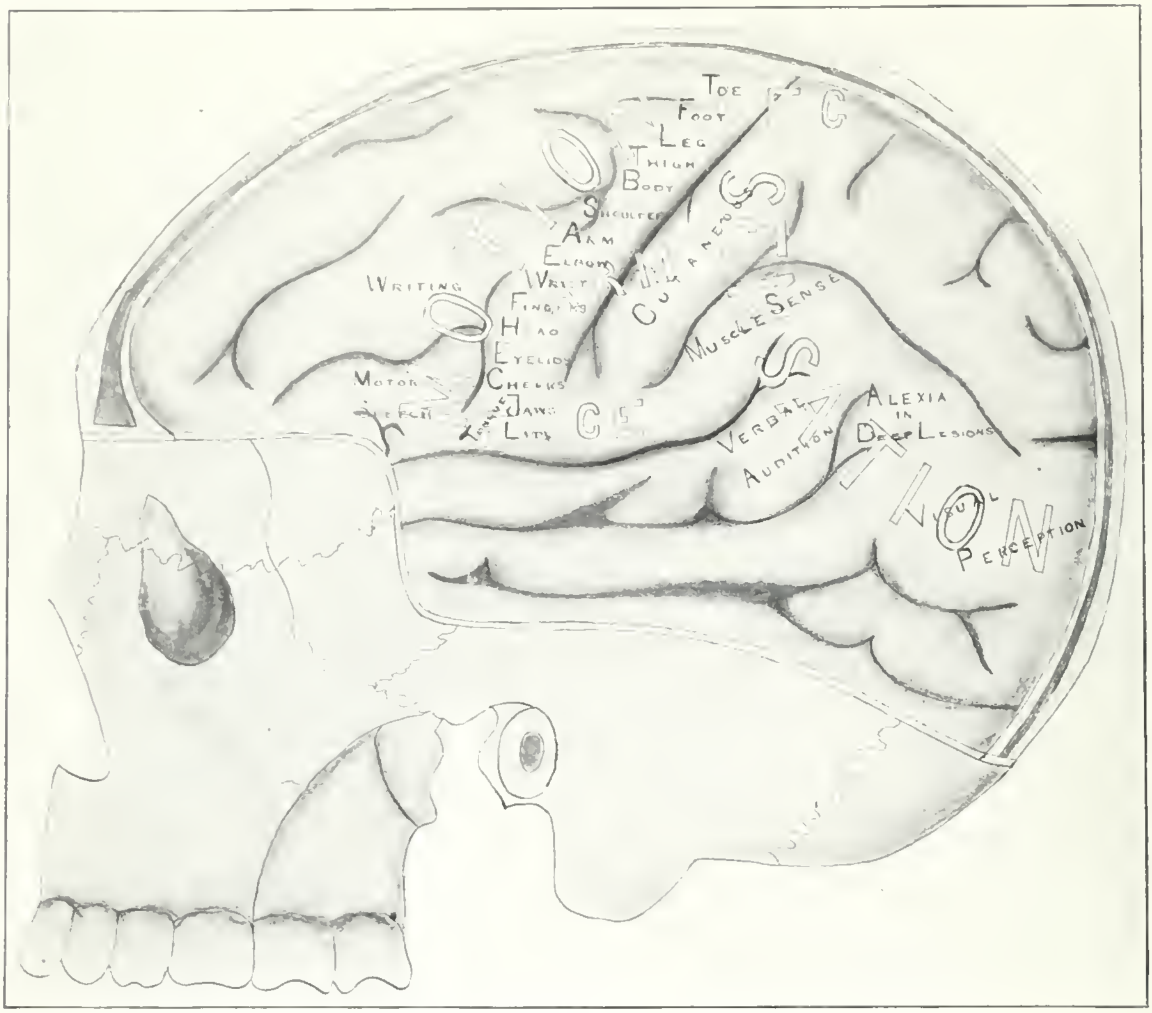


Fig. 65

Schematic representation of the convex surface of the left cerebral hemisphere, showing the motor and sensory areas, and the location of the cortical functions.

See 1282–6, 1348–9, 1352, 1355, 1362, 1367–9, 1373, 1376, 1379, 1380–1, 1387, 1389–91, 1400–5

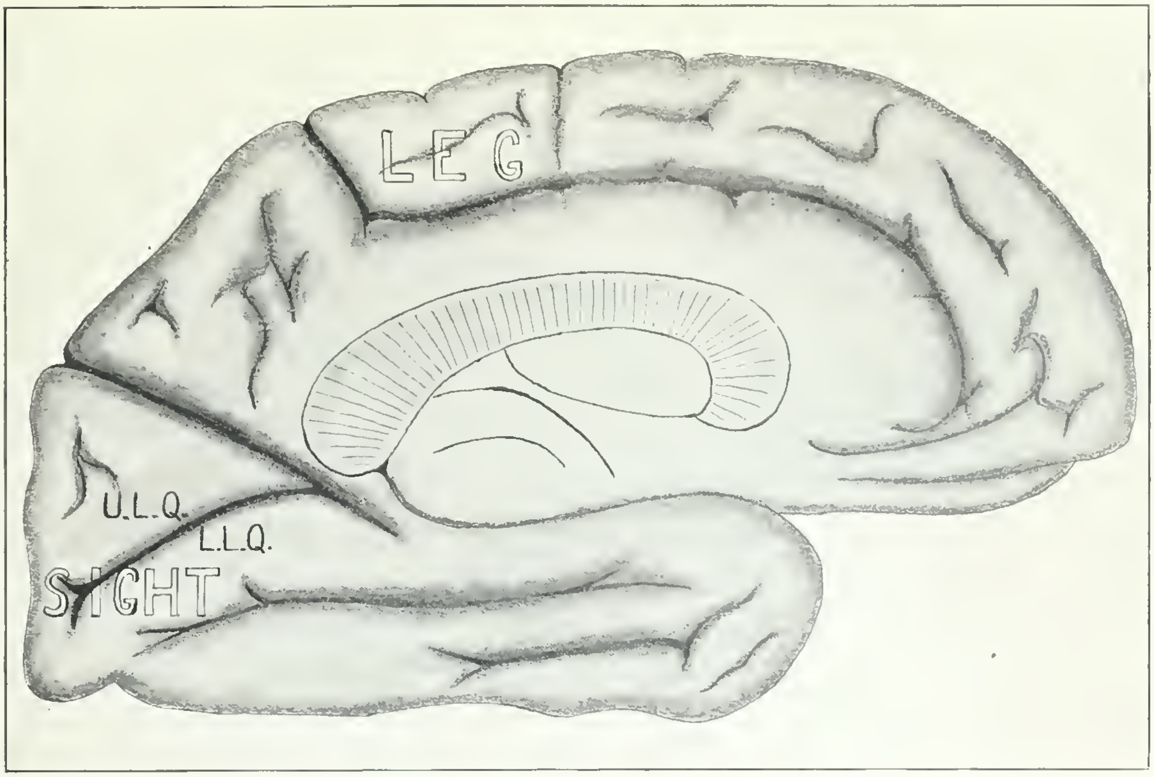


FIG. 16

Schematic representation of the median surface of the left cerebral hemisphere. See 1364-6.

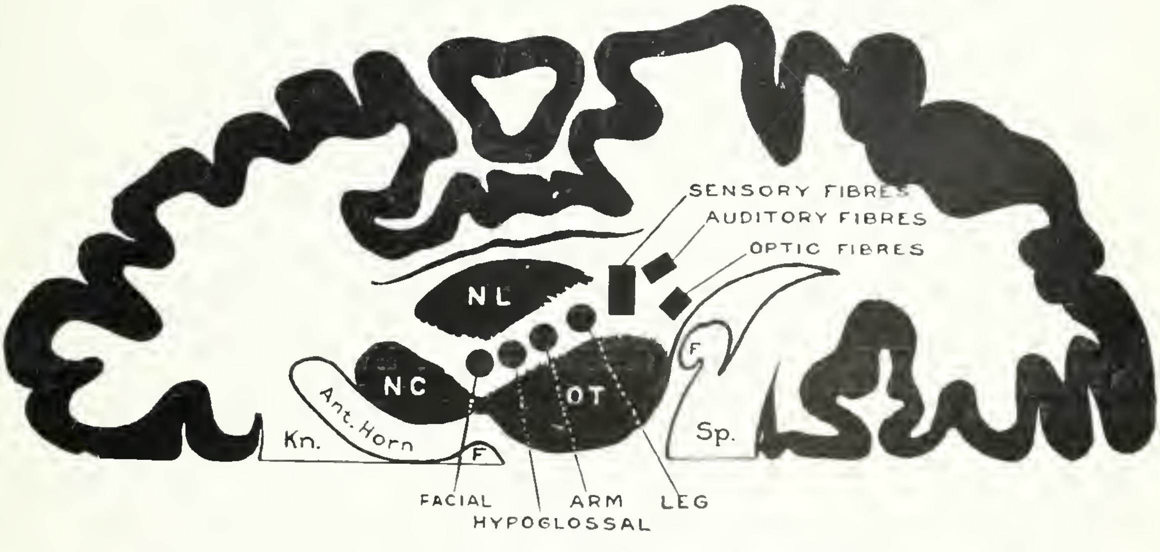


FIG. 17

Horizontal Section through Right Hemisphere showing the principal tracts situated in the Internal Capsule; Kn, Genu of Corpus Callosum; F, Fornix; NC, Caudate Nucleus; NL, Lenticular Nucleus; OT, Optic Thalamus. Sp, Splenium of Corpus Callosum.

See 1275-6, 1354, 1361, 1385-6.

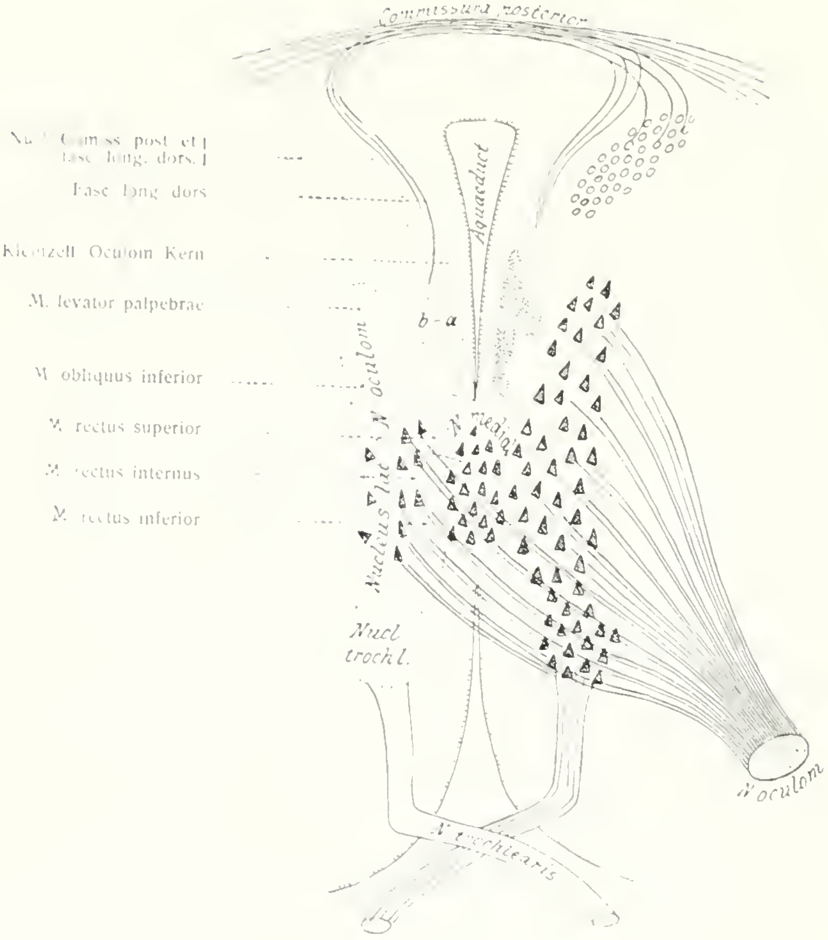


FIG. 18

Schematic representation of the nuclei situated beneath the floor of the sylvian aqueduct, showing the origin of the posterior commissure, the oculo-motor and trochlearis nerves, as well as the nuclear localization of the centers for the individual ocular muscles (after Edinger).

See 692, 700, 816, 1316.

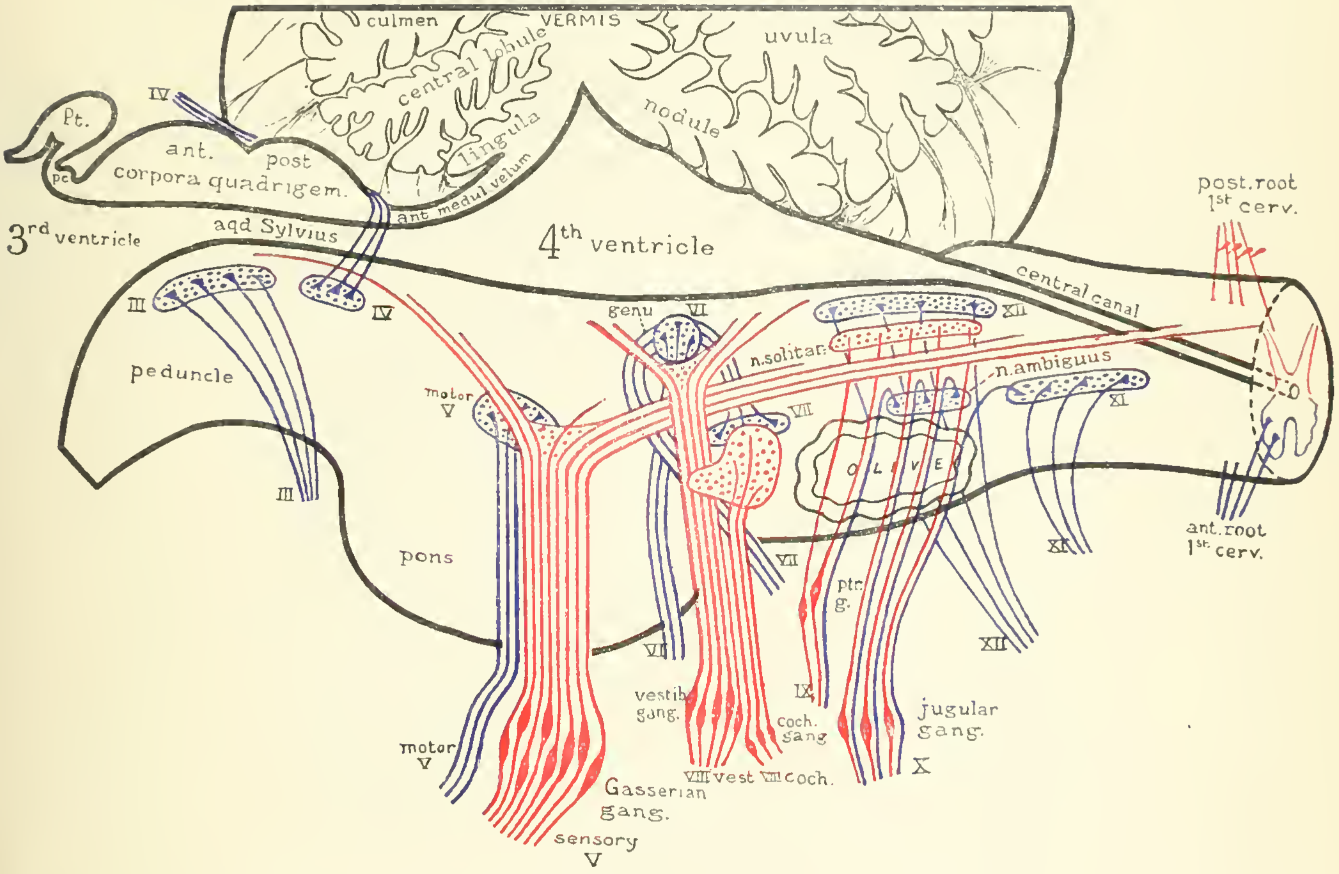


FIG. 19

Schematic representation of Brain stem; showing nuclei and nerve roots. The sensory nuclei and nerve roots are colored red, the motor blue. See 1301-4, 1323-32, 1353, 1375, 1378, 1398.

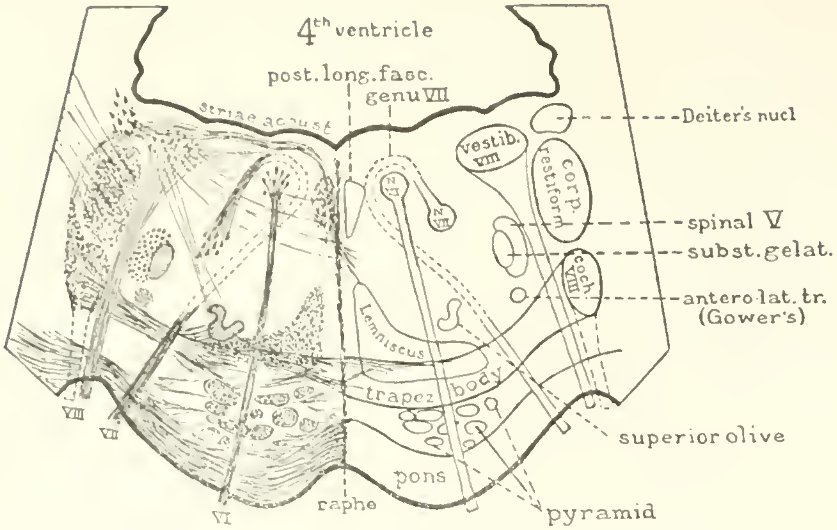


Fig. 20

Diagrammatic transverse section through the pons at a level slightly posterior to the superficial origin of the trigeminus.

See 1269, 1301-4, 1327-30, 1353, 1383, 1388, 1398.

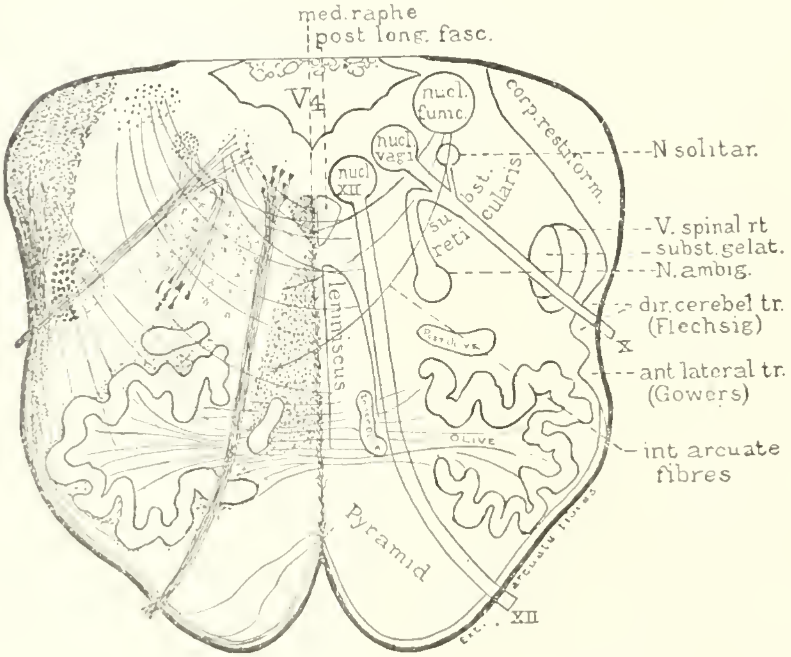


Fig. 21

Diagrammatic transverse section through the medulla, approximately near its middle.

See 1268, 1301-4, 1382, 1388, 1398.

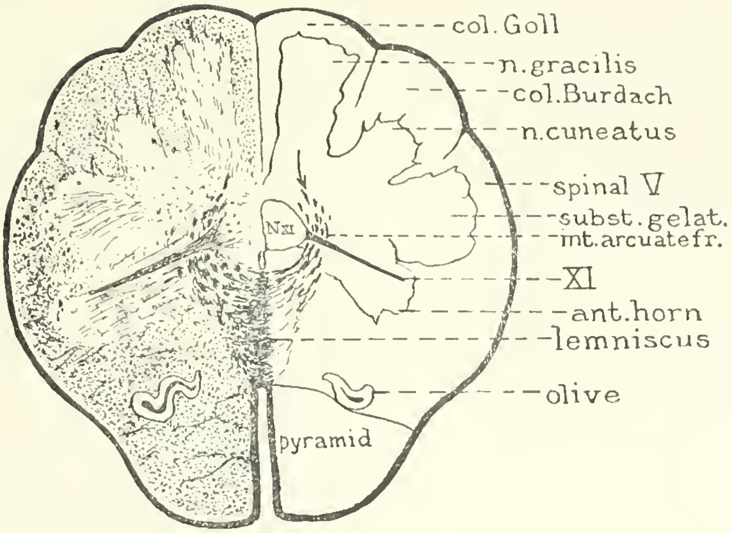


Fig. 22

Transverse section of medulla just above motor decussation and just above line of junction with the cord showing the sensory decussation and the topography of the lowest level of the medulla.

See 1268

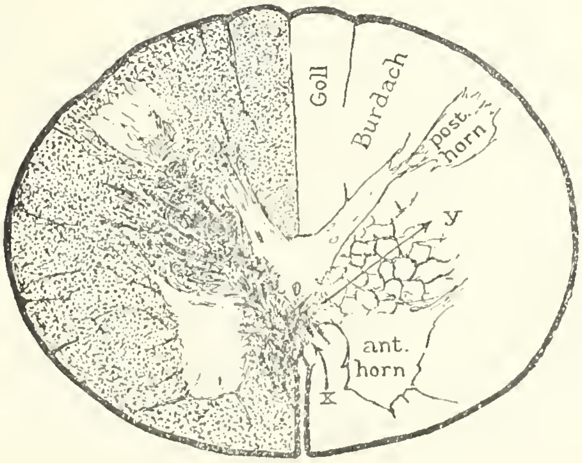


Fig. 23

Transverse section of the cord just at the line of junction with the medulla, showing the motor decussation and the topography of the uppermost level of the cord.

See 1268

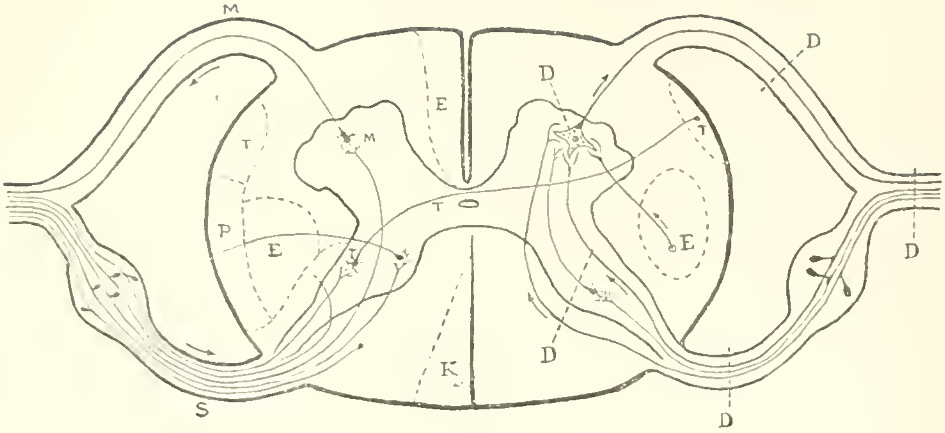


Fig. 24

DIAGRAMMATIC SECTION OF THE SPINAL CORD TO ILLUSTRATE ITS PHYSIOLOGY

Left side shows situation of lesions causing disorders of motion and sensation.

Right side shows situation of lesions causing disorders of reflex activity.

Destructive lesions at M or E cause diminution, slight irritative lesions, exaggeration, of motion. Destructive lesions at S cause permanent anaesthesia, analgesia, thermic anesthesia and loss of muscle sense. Destructive lesions at T cause analgesia and thermic anesthesia. Destructive lesions at P cause ataxia. Destructive lesions at K cause loss of muscle sense, ataxia and anaesthesia. Irritative lesions at S, K, T, or P, may cause exaggeration, or perversion, or both, of sensation. Destructive lesions at D cause diminution, and at E, exaggeration, of reflex activity. Slight irritative lesions at D cause exaggeration, and at E diminution, of reflex activity.

Symptoms of lesions at M are described in 252, 263, 495, 547 and 789; at E in 281, 254, 256, 525-6, 796-7 and 1372-4-7; at S in 824; at T in 1356-8-60; at P in 251 and 654; at K in 280, 654a, 785, 1347 and 1350-1. The results of lesions at D and E are discussed in Chart V a.

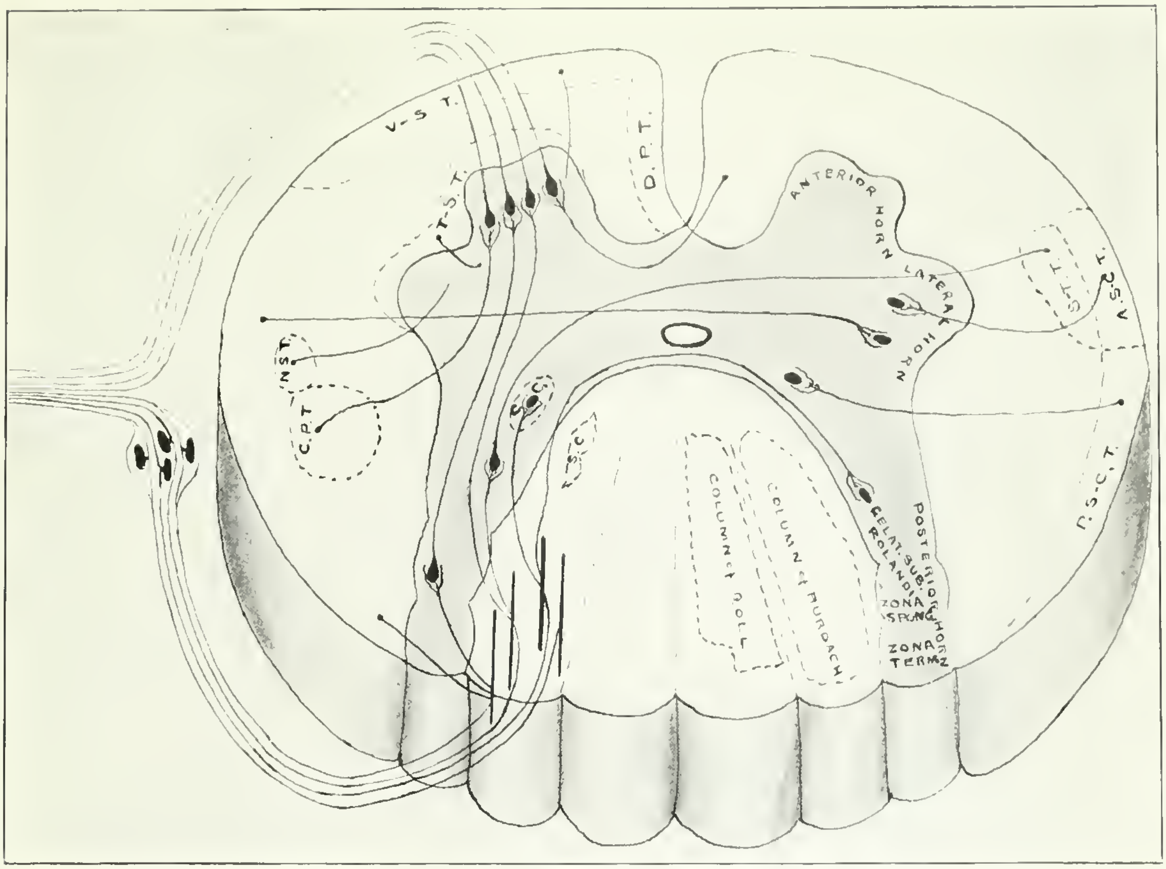


FIG. 25

A SCHEMATIC REPRESENTATION OF A TRANSVERSE SECTION OF THE SPINAL CORD; SEVERAL LEVELS BEING COMBINED INTO ONE

DESCENDING TRACTS

V.S.T.—vestibulo-spinal tract
T.S.T.—tecto-spinal tract
D.P.T.—direct pyramidal tract
C.P.T.—crossed pyramidal tract
N.S.T.—rubro-spinal and thalamo-spinal tracts
S.C.—Schultze's comma

ASCENDING TRACTS

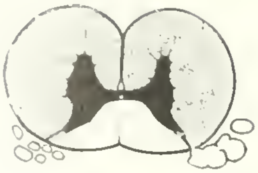
S.T.T.—spino-thalmic tract
A.S.C.T.—anterior spino-cerebellar tract (Gower's tract)
P.S.C.T.—posterior spino-cerebellar tract (Flechsig's tract)
C.C.—Clark's column

On the left side of the cord are represented the nerve roots and those bundles of long fibers in the white columns which carry impulses downward from the brain to the spinal cord, and on the right side are represented those bundles of long fibers in the white columns which carry impulses upward from the spinal cord or spinal ganglia to the brain. It hardly needs to be stated that, although in this figure these long bundles of fibers are represented on one side only, they are really situated symmetrically on each side of the cord. The short fibers which connect different levels of the cord together are not represented in the figure.

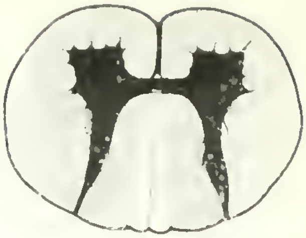
Lesions involving the pyramidal tract give rise to a spastic paralysis described under 251, 525, 654, 797, 1212 and 1356. Lesions involving the anterior horns give rise to atrophic paralysis, the acute forms of which are described under 195, 789, 1148, 1233 and 1301; while the chronic forms are described under 547, 695, 797, 1149 and 1304. Lesions involving the posterior horn give rise to symptoms described under 1302. Lesions of posterior columns give rise to symptoms described under 785, 1302, 1347, 1350-1 and 1396. Lesions of the spino-cerebellar tract give rise to symptoms described under 654, 1356 and 1360. Lesions of the spino-thalmic tract and of the anterior commissure of the gray matter give rise to symptoms described under 365, 841 and 1357-9. Lesions of the whole of one lateral half of the cord give rise to symptoms described under 142, 509, 838 and 984; while lesions of the whole transverse section of the cord give rise to symptoms described under 485, 513-4, 517-8, 520, 549-50, 791, 795, 825, 828-9, 835 and 980.

Fig. 26

Schematic representation of the more important diseases of the spinal cord

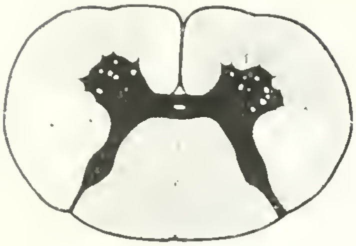


Locomotor Ataxia
lumbar region

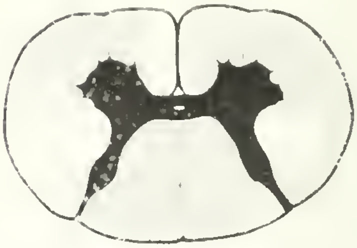


Locomotor Ataxia
cervical region

See 545, 416, 419-20, 455, 661, 755, 784, 827, 891, 894, 911, 979, 987, 1004, 1015, 1172, 1186, 1217 and 1251

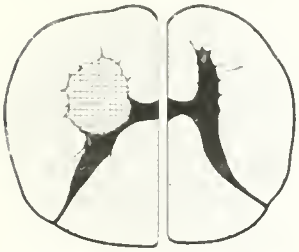


Amyotrophic Lateral Sclerosis



Descending Degeneration of Pyramidal Tracts

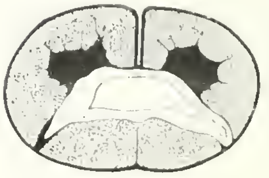
See 547, 695, 797, 1149, and 526, 660 and 796



Acute Stage   Chronic Stage

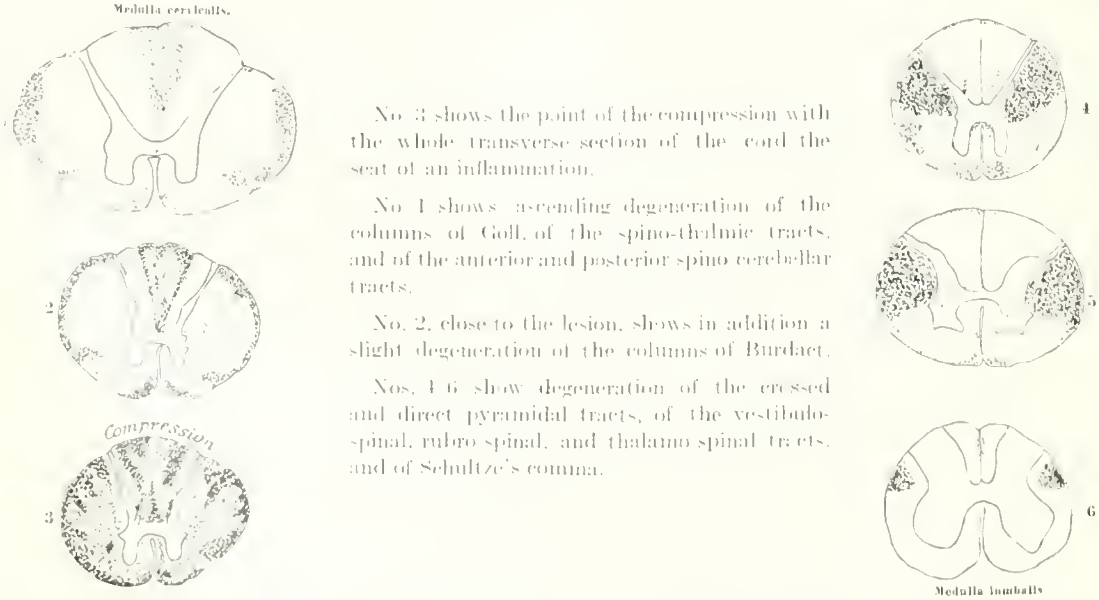
Anterior Poliomyelitis

See 416, 419, 495, 789, 1148 and 1255



Syringomyelia

See 552, 693, 857, 1009, 1170, 1187, 1357 and 1359



No. 3 shows the point of the compression with the whole transverse section of the cord the seat of an inflammation.

No. 1 shows ascending degeneration of the columns of Goll, of the spino-thalmic tracts, and of the anterior and posterior spino cerebellar tracts.

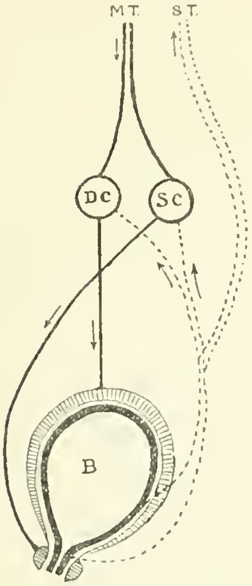
No. 2, close to the lesion, shows in addition a slight degeneration of the columns of Burdact.

Nos. 4-6 show degeneration of the crossed and direct pyramidal tracts, of the vestibulo-spinal, rubro spinal, and thalamo spinal tracts, and of Schultze's comma.

Compression Myelitis with the consequent Ascending and Descending Degenerations. See 520, 795.

SCHEMATIC REPRESENTATION OF SOME POINTS IN THE PHYSIOLOGY AND PATHOLOGY OF THE SPINAL CORD AND PERIPHERAL NERVES.

Diagram to illustrate the mechanism of the bladder reflex



B represents the bladder. S C represents the reflex centre, with its motor and sensory neurons, for the sphincter of the bladder, which is excited to action by urine in the neck of the bladder or in the prostatic urethra. D C represents the reflex centre, with its motor and sensory neurons, for the detrusor of the bladder, which is excited to action by the distention of the walls of the bladder. These two reflexes are antagonistic and the sensory surface irritated being much larger in the latter (D C), than in the former (S C), reflex, the detrusor reflex will eventually overpower the sphincter reflex under normal conditions. S T represents the sensory tract connecting the bladder with the brain, by means of which the individual is informed as to the degree of fulness of the bladder. M T represents the motor tract connecting the cerebral with the spinal centre by means of which the individual can inhibit the activity of either centre (up to a certain degree) and increase the activity of the antagonistic centre.

Fig. 27

Fig. 29 illustrates effects of lesions of cauda equina.

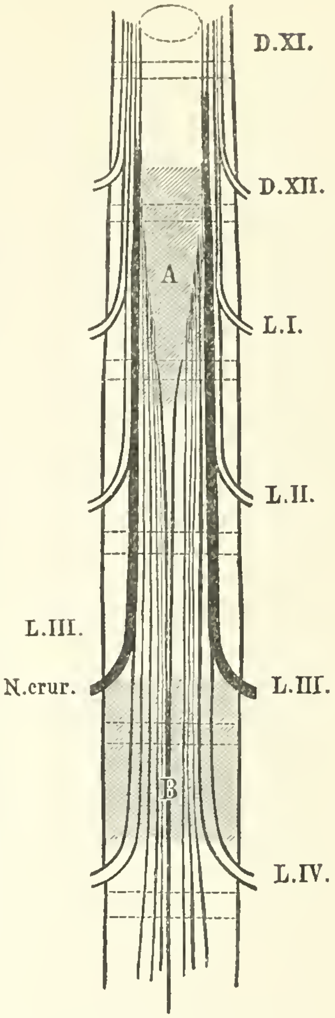
If the lesion is at "A" there is complete motor paralysis of both legs, and complete anesthesia of the whole of both legs and of the perineum, buttocks, scrotum and penis, and all reflexes of the legs are abolished.

If the lesion is at "B" there is complete motor paralysis of both legs, except the flexors of the thigh and the extensors of the leg, and complete anesthesia of the perineum, buttocks, scrotum and penis, and of the posterior surface of the thighs, the posterior and lateral surfaces of the legs, and all of the foot, except a small area on its inner surface. All the reflexes of the legs except the knee-jerks are abolished.

In both cases the muscles atrophy, there is no zone of hyperesthesia above the anesthesia and the bladder and rectum show a motor and sensory paralysis.

If the lesion is limited to the conus medullaris there is a paralysis of the rectum and bladder and an anesthesia of the penis, scrotum, perineum, one inch about anus, and the upper two-thirds of the posterior surface of the thighs. Otherwise there is no paralysis of motion or sensation.

See 487, 721, 1007, 1308.



(After Fr. Schultze-Köster.

Fig. 28

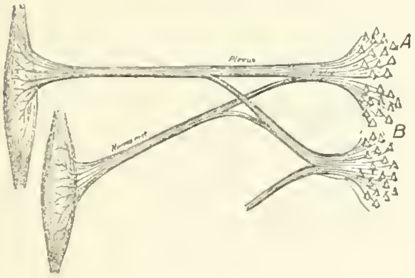


Fig. 29

Showing the innervation of muscles through more than one nerve root, so that the destruction of one nerve root or of one group of nerve cells does not cause a complete and permanent paralysis.

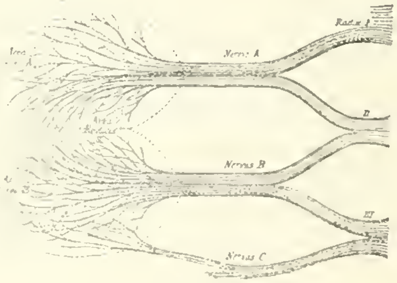


Fig. 30

A diagram showing that a given sensory area of the skin is supplied by filaments from several nerve roots; so that division of one root does not necessarily produce total anesthesia. It also shows the peripheral overlapping; so that the area supplied by one nerve can be almost completely supplied by neighboring nerves.

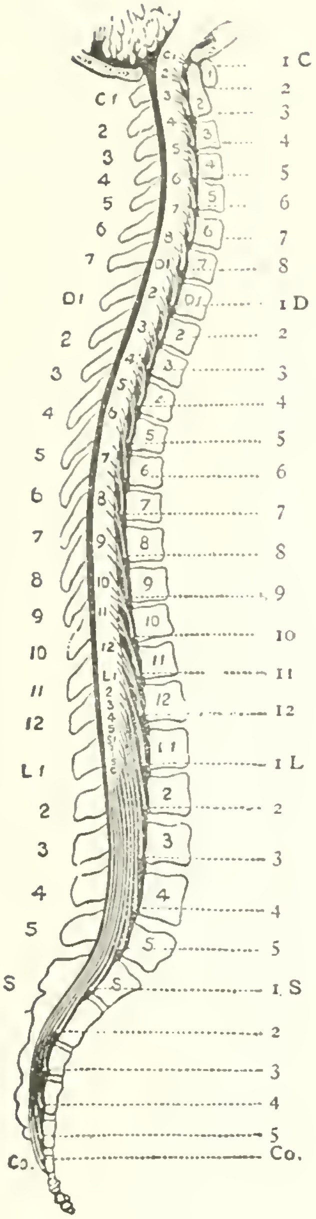


FIG. 31

MOTOR AND REFLEX FUNCTIONS OF THE SPINAL-CORD SEGMENTS (MODIFIED AFTER STARR AND EDINGER)

SEGMENT		MUSCLES	REFLEXES
Cervical		Sternomastoid	
		Trapezius	
2–3		Scaleni	
		Small rotators of head	
		Diaphragm	
		Lev. ang. scap.	Dilatation of pupil by irritating side of neck, 4 cervical to 1 dorsal
		Rhomboids	
4		Spinati	
		Deltoid	
		Supinat. long	Scapular reflexes, 5 C–1 D
		Biceps	Supinat. long., 5 C
	5	Supinat. brev.	
		Serrat. mag.	
		Pectoralis (clav.)	Biceps, 5–6 C
		Teres minor	Triceps, 6 C
		Pronators	Posterior wrist, 6–8 C
6		Brachialis ant.	Scapulo-humeral, 7 C
		Triceps	
	7	Long extensors of wrist and fingers	Anterior wrist, 7–8 C
		Pectoralis (costal)	
		Latiss. dorsi	Palmar, 7 C–1 D
		Teres maj.	
		Long flexors, wrist and fingers	Epigastric, 4–7 D
8		Extensors of thumb	
Dorsal 1	1	Intrinsic hand-muscles	Abdominal, 7–11 D
2–12		Dorsal and abdominal muscles	
Lumbar		Abdominal muscles	Cremaster, 1–3 L
	1	Iliacus	
		Psoas	Patellar, 2–4 L
2		Sartorius	Bladder, 2–4 L
		Flexors of knee	
		Quad. femoris	
	3	Int. rotators of thigh	
		Adductors of thigh	Rectal, 4 L–2 S
4		Abductors of thigh	
		Tibialis ant.	Gluteal, 4–5 L
		Calf-muscles	
	5	Ex. rotators of thigh	
		Extensors of toes	Achilles, Ankle-clonus, 1–3 S
Sacral		Peronei	
1–2		Long flex. of toes	Plantar, 1–2 S
		Intrinsic foot-muscles	Anal, Virile, 3–5 S
3–5		Perineal muscles	

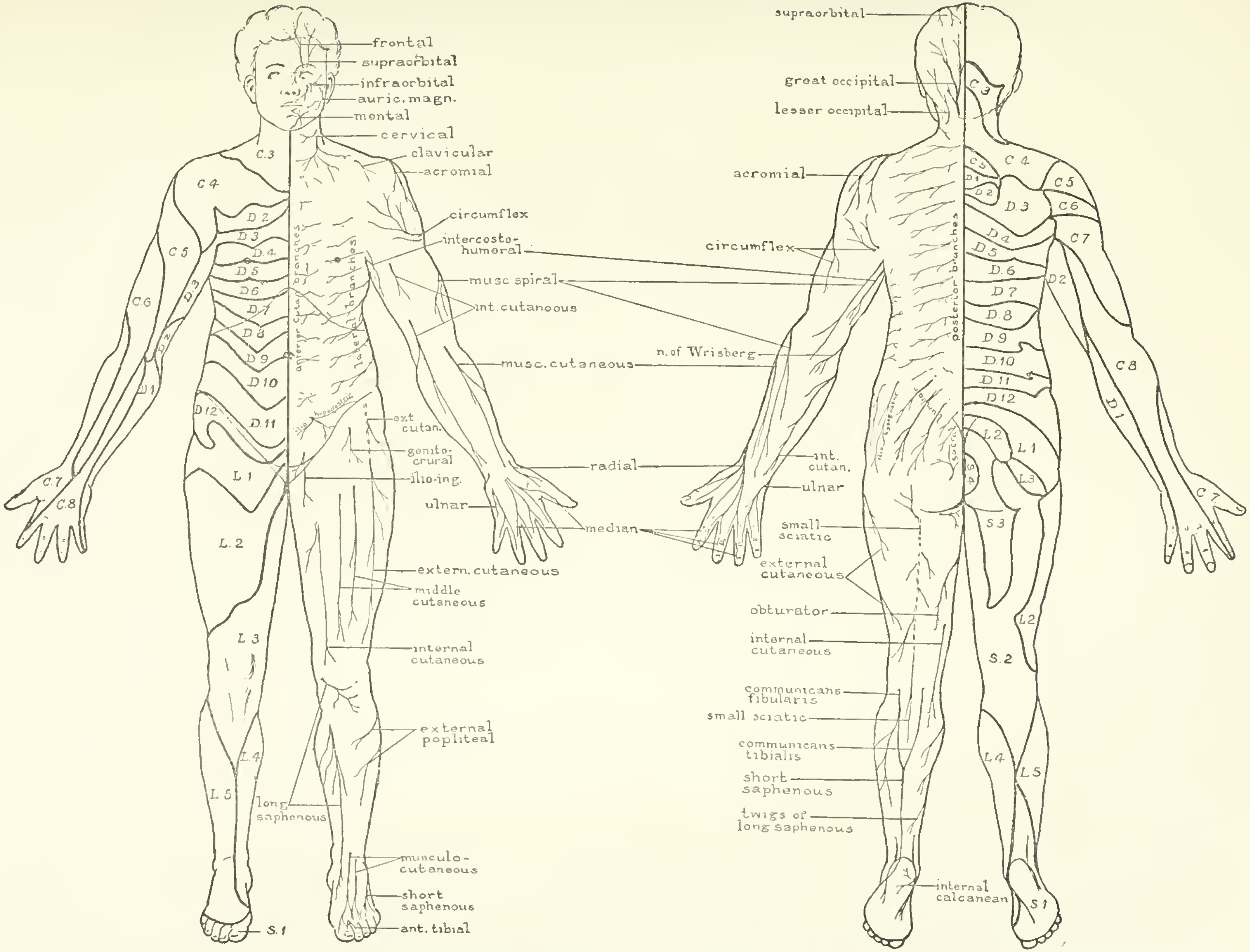
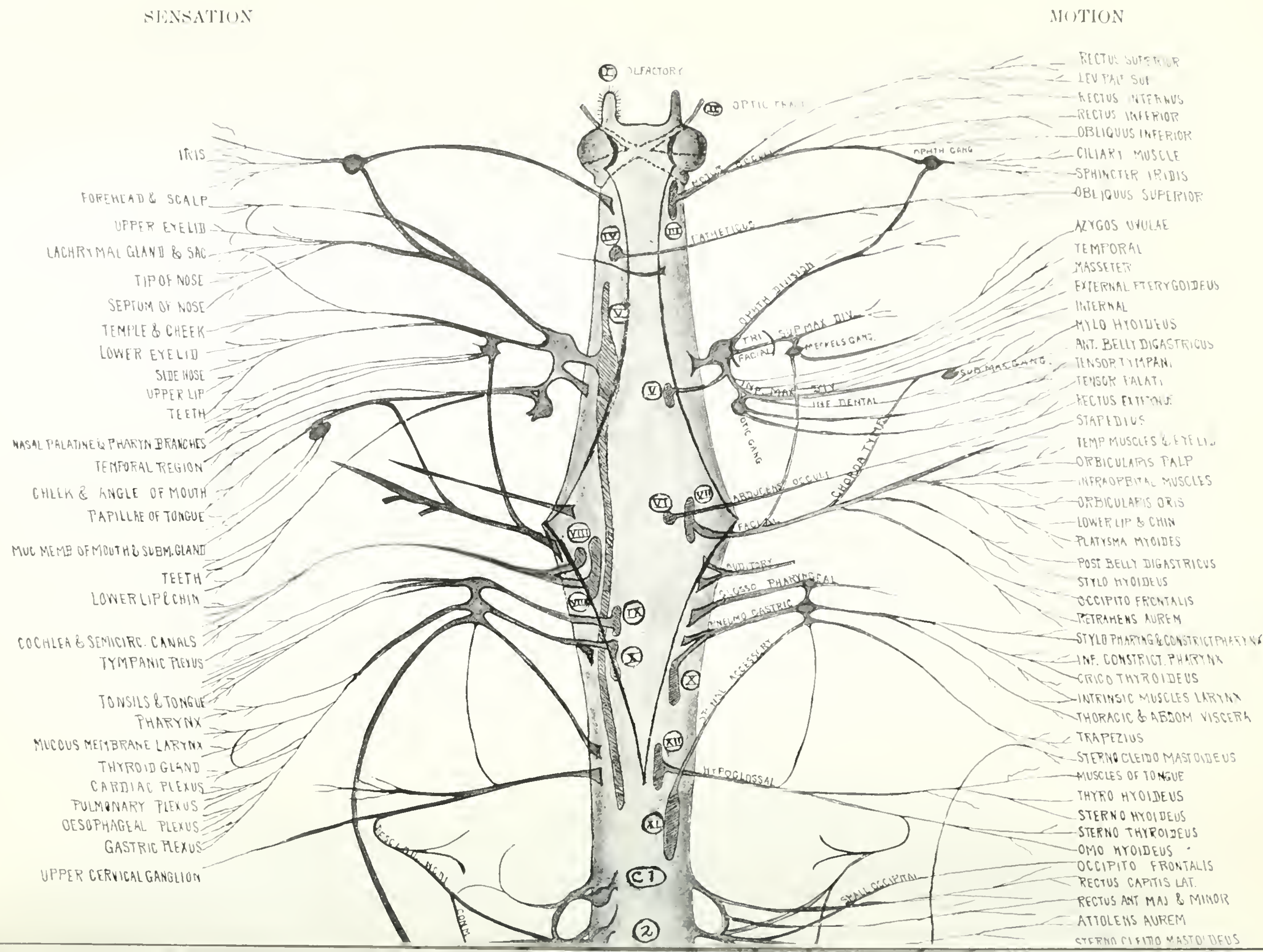
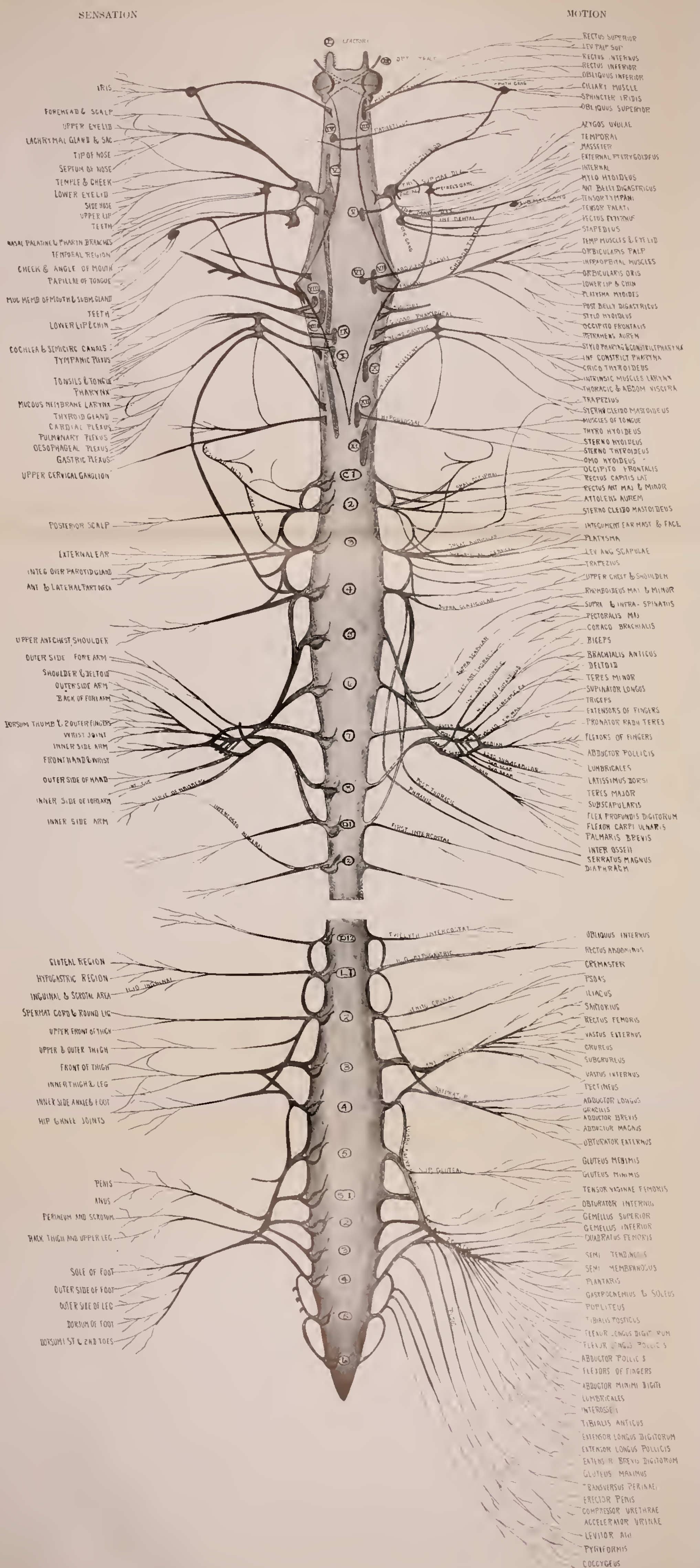


FIG. 32.—Representing on right side of body the sensory cutaneous areas connected with each spinal segment, and on the left side the cutaneous distribution of the sensory nerves. See 822, 824 and 1301–4


SENSATION
MOTION
I OLFACTORY
II OPTIC TRACT
III
IV
V
VI
VII
VIII
IX
X
XI
XII
C1
2
IRIS
FOREHEAD & SCALP
UPPER EYELID
LACHRYMAL GLAND & SAC
TIP OF NOSE
SEPTUM OF NOSE
TEMPLE & CHEEK
LOWER EYELID
SIDE NOSE
UPPER LIP
TEETH
NASAL PALATINE & PHARYN BRANCHES
TEMPORAL REGION
CHEEK & ANGLE OF MOUTH
PAPILLAE OF TONGUE
MUC MEMB OF MOUTH & SUBM. GLAND
TEETH
LOWER LIP & CHIN
COCHLEA & SEMICIRC. CANALS
TYMPANIC PLEXUS
TONSILS & TONGUE
PHARYNX
MUCOUS MEMBRANE LARYNX
THYROID GLAND
CARDIAC PLEXUS
PULMONARY PLEXUS
OESOPHAGEAL PLEXUS
GASTRIC PLEXUS
UPPER CERVICAL GANGLION
RECTUS SUPERIOR
LEV PALP SUP
RECTUS INTERNUS
RECTUS INFERIOR
OBLIQUUS INFERIOR
CILIARY MUSCLE
SPHINCTER IRIDIS
OBLIQUUS SUPERIOR
AZYGOS UVULAE
TEMPORAL
MASSETER
EXTERNAL PTERYGOIDEUS
INTERNAL
MYLO HYOIDEUS
ANT. BELLY DIGASTRICUS
TENSOR TYMPANI
TENSOR PALATI
RECTUS EXTERNUS
STAPEDIUS
TEMP MUSCLES & EYELID
ORBICULARIS PALP
INFRAORBITAL MUSCLES
ORBICULARIS ORIS
LOWER LIP & CHIN
PLATYSMA MYOIDES
POST BELLY DIGASTRICUS
STYLO HYOIDEUS
OCCIPITO FRONTALIS
RETRAHENS AUREM
STYLO PHARYNG & CONSTRICT PHARYNX
INF. CONSTRICT. PHARYNX
CRICO THYROIDEUS
INTRINSIC MUSCLES LARYNX
THORACIC & ABDOM VISCERA
TRAPEZIUS
STERNO CLEIDO MASTOIDEUS
MUSCLES OF TONGUE
THYRO HYOIDEUS
STERNO HYOIDEUS
STERNO THYROIDEUS
OMO HYOIDEUS
OCCIPITO FRONTALIS
RECTUS CAPITIS LAT.
RECTUS ANT MAJ & MINOR
ATTOLENS AUREM
STERNO CLEIDO MASTOIDEUS
OPHTH GANG
MOTOR OCULI
PATHETICUS
OPHTH DIVISION
SUP MAX DIV
TRI
FACIAL
MECKELS GANG
SUB MAX GANG
INF MAX DIV
INF DENTAL
OTIC GANG
CHORDA TYMPANI
ABDUCENS OCCULI
FACIAL
AUDITORY
GLOSSO PHARYNGEAL
PNEUMO GASTRIC
SPINAL ACCESSORY
HYPOGLOSSAL
DESCEND NONI
COMM
SMALL OCCIPITAL


SENSATION
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IRIS
FOREHEAD & SCALP
UPPER EYELID
LACHRYMAL GLAND & SAC
TIP OF NOSE
SEPTUM OF NOSE
TEMPLE & CHEEK
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THYROID GLAND
CARDIAC PLEXUS
PULMONARY PLEXUS
OESOPHAGEAL PLEXUS
GASTRIC PLEXUS
UPPER CERVICAL GANGLION
POSTERIOR SCALP
EXTERNAL EAR
INTEG OVER PAROTID GLAND
ANT & LATERAL PART NECK
UPPER ANT CHEST, SHOULDER
OUTER SIDE FORE ARM
SHOULDER & DELTOID
OUTER SIDE ARM
BACK OF FOREARM
DORSUM THUMB & 2 OUTER FINGERS
WRIST JOINT
INNER SIDE ARM
FRONT HAND & WRIST
OUTER SIDE OF HAND
INNER SIDE OF FOREARM
INNER SIDE ARM
GLUTEAL REGION
HYPOGASTRIC REGION
INGUINAL & SCROTAL AREA
SPERMAT CORD & ROUND LIG
UPPER FRONT OF THIGH
UPPER & OUTER THIGH
FRONT OF THIGH
INNER THIGH & LEG
INNER SIDE ANKLE & FOOT
HIP & KNEE JOINTS
PENIS
ANUS
PERINEUM AND SCROTUM
BACK THIGH AND UPPER LEG
SOLE OF FOOT
OUTER SIDE OF FOOT
OUTER SIDE OF LEG
DORSUM OF FOOT
DORSUM 1 ST & 2 ND TOES
RECTUS SUPERIOR
LEV PALP SUP
RECTUS INTERNUS
RECTUS INFERIOR
OBLIQUUS INFERIOR
CILIARY MUSCLE
SPHINCTER IRIDIS
OBLIQUUS SUPERIOR
AZYGOS UVULAE
TEMPORAL
MASSETER
EXTERNAL PTERYGOIDEUS
INTERNAL
MYLO HYOIDEUS
ANT BELLY DIGASTRICUS
TENSOR TYMPANI
TENSOR PALATI
RECTUS EXTERNUS
STAPEDIUS
TEMP MUSCLES & EYE LID
ORBICULARIS PALP
INFRAORBITAL MUSCLES
ORBICULARIS ORIS
LOWER LIP & CHIN
PLATYSMA MYOIDES
POST BELLY DIGASTRICUS
STYLO HYOIDEUS
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STERNO HYOIDEUS
STERNO THYROIDEUS
OMO HYOIDEUS
OCCIPITO FRONTALIS
RECTUS CAPITIS LAT
RECTUS ANT MAJ & MINOR
ATTOLENS AUREM
STERNO CLEIDO MASTOIDEUS
INTEGUMENT EAR MAST & FACE
PLATYSMA
LEV ANG SCAPULAE
TRAPEZIUS
UPPER CHEST & SHOULDER
RHOMBOIDEUS MAJ & MINOR
SUPRA & INFRA- SPINATUS
PECTORALIS MAJ
CORACO BRACHIALIS
BICEPS
BRACHIALIS ANTICUS
DELTOID
TERES MINOR
SUPINATOR LONGUS
TRICEPS
EXTENSORS OF FINGERS
PRONATOR RADII TERES
FLEXORS OF FINGERS
ABDUCTOR POLLICIS
LUMBRICALES
LATISSIMUS DORSI
TERES MAJOR
SUBSCAPULARIS
FLEX PROFUNDIS DIGITORUM
FLEXOR CARPI ULNARIS
PALMARIS BREVIS
INTER OSSEII
SERRATUS MAGNUS
DIAPHRAGM
OBLIQUUS INTERNUS
RECTUS ABDOMINUS
CREMASTER
PSOAS
ILIACUS
SARTORIUS
RECTUS FEMORIS
VASTUS EXTERNUS
CRUREUS
SUBCRUREUS
VASTUS INTERNUS
PECTINEUS
ADDUCTOR LONGUS
GRACILIS
ADDUCTOR BREVIS
ADDUCTOR MAGNUS
OBTURATOR EXTERNUS
GLUTEUS MEDIMIS
GLUTEUS MINIMIS
TENSOR VAGINAE FEMORIS
OBTURATOR INTERNUS
GEMELLUS SUPERIOR
GEMELLUS INFERIOR
QUADRATUS FEMORIS
SEMI TENDINOSUS
SEMI MEMBRANOSUS
PLANTARIS
GASTROCNEMIUS & SOLEUS
POPLITEUS
TIBIALIS POSTICUS
FLEXOR LONGUS DIGITORUM
FLEXOR LONGUS POLLICIS
ABDUCTOR POLLICIS
FLEXORS OF FINGERS
ABDUCTOR MINIMI DIGITI
LUMBRICALES
INTEROSSEI
TIBIALIS ANTICUS
EXTENSOR LONGUS DIGITORUM
EXTENSOR LONGUS POLLICIS
EXTENSOR BREVIS DIGITORUM
GLUTEUS MAXIMUS
TRANSVERSUS PERINAEI
ERECTOR PENIS
COMPRESSOR URETHRAE
ACCELERATOR URINAE
LEVATOR ANI
PYRIFORMIS
COCCYGEUS
SPHINCTOR ANI
OLFACTORY
OPHTH GANG
SUPRA CLAVICULAR
SUPRA SCAPULAR
PHRENIC
POST THORACIC
FIRST INTERCOSTAL
INTERCOSTO HUMERAL
TWELFTH INTERCOSTAL
ILIO HYPOGASTRIC
ILIO INGUINAL
GENITO CRURAL
OBTURAT
SUP GLUTEAL
C 1
D 1
D 12
L 1
S 1

Fig 33

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